THE PAPER INDUSTRY and PAPER WORLD

EDUCATIONAL NEWS MAGAZINE—NOVEMBER, 1946

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Vacuum Connection "As You Like It" with the Downingtown Suction Roll

Downingtown Suction Couch and Press Rolls are available with front or rear end suction, or with suction connection at both ends, if desired. Front end suction connection may be inside or outside the machine, as illustrated at the left. All of these arrangements are standard with us, thus no special construction is needed. Press rolls are available with or without rubber covering and we will gladly recover your old press rolls. Send for Catalog No. 120.

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

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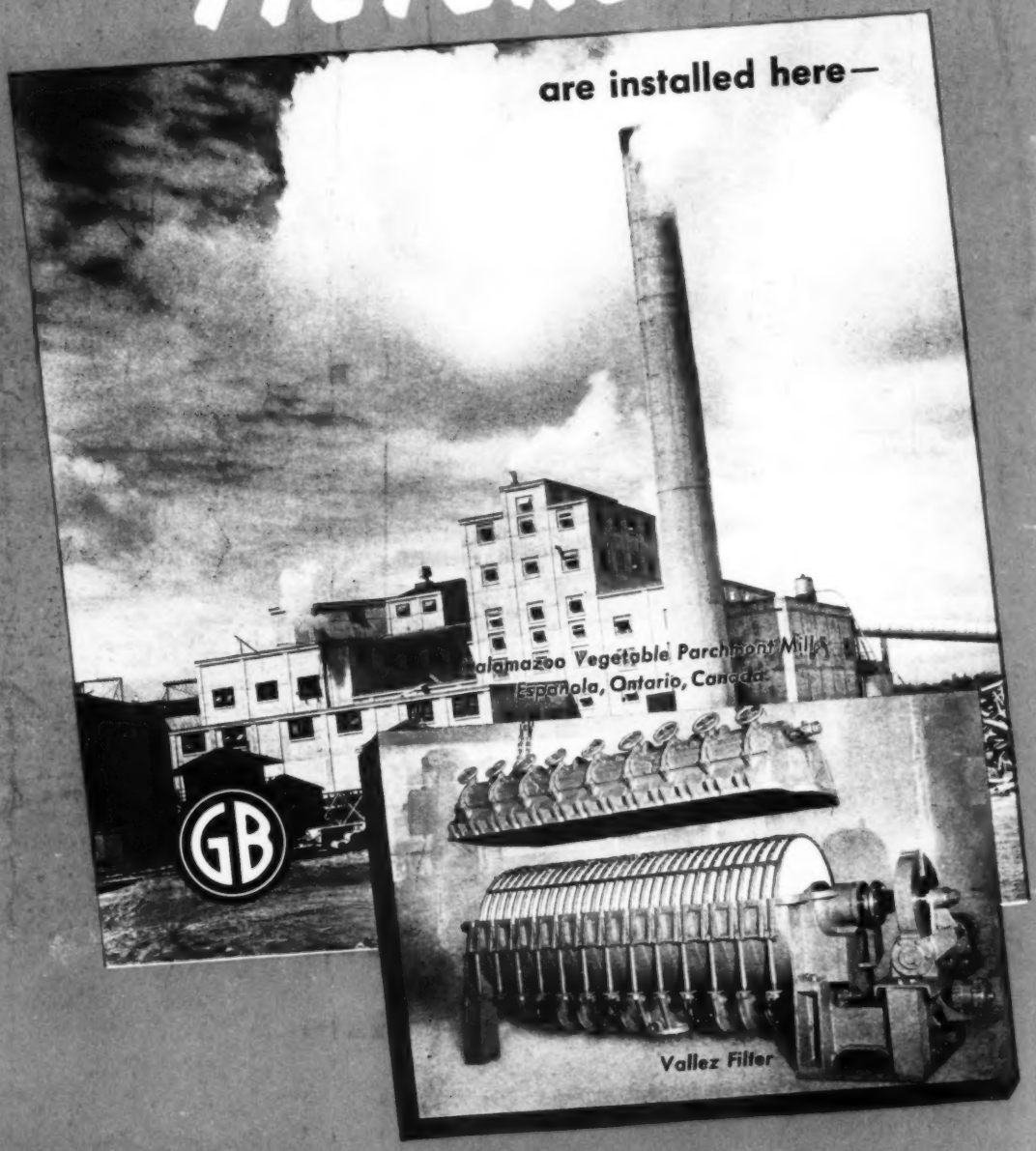
Designers & Builders
Paper Making Machinery

GOSLIN-BIRMINGHAM

FILTERS



GOSLIN-BIRMINGHAM MANUFACTURING CO., INC.

BIRMINGHAM, ALABAMA, U. S. A.

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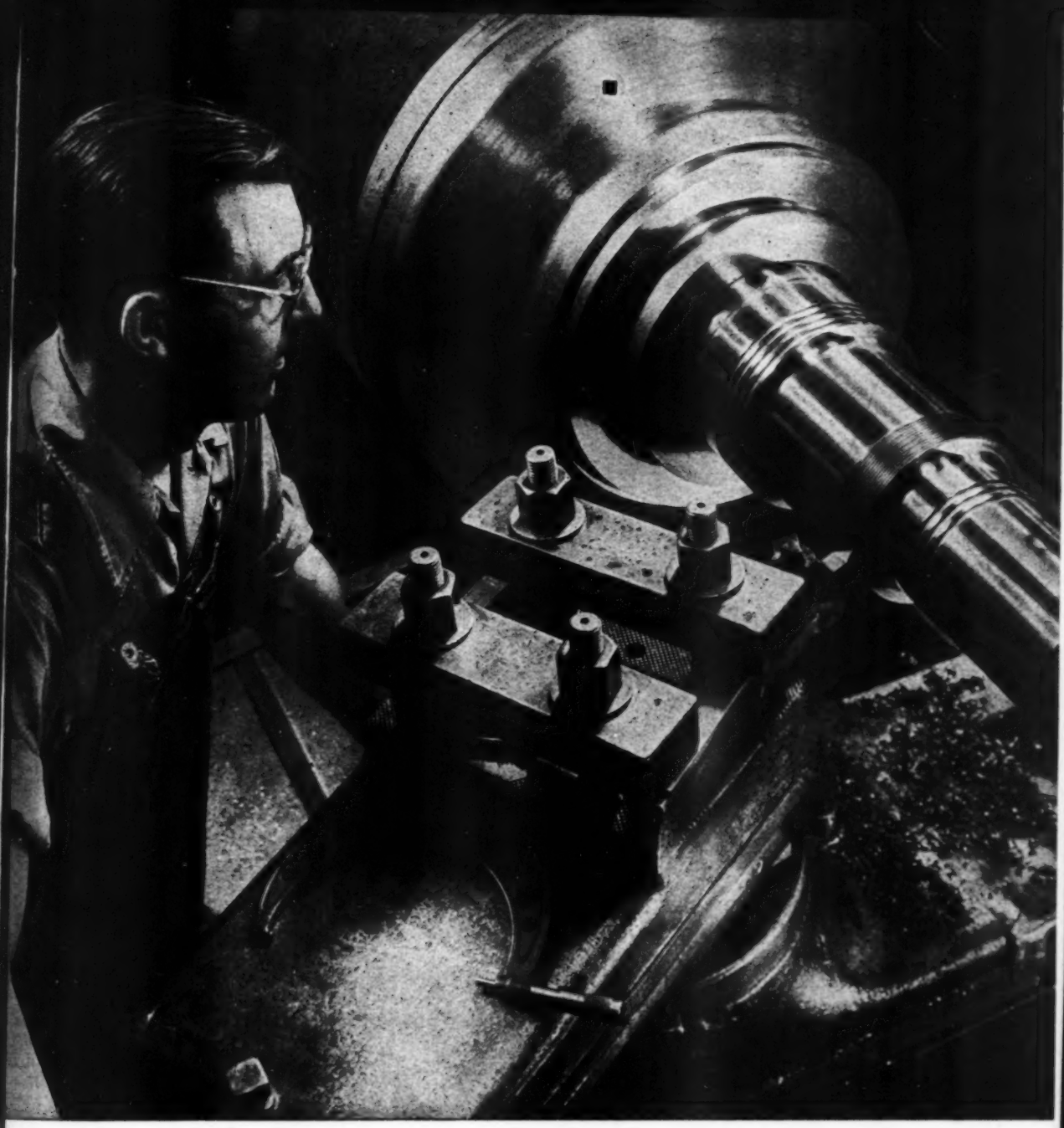

Portrait of precision . . .

Operation: threading the journal of a wringer roll designed to run 1,500 feet per minute. Machining must be such that the roll will operate at extremely high speeds. Operator is John LeFever, who has been with Beloit 13 years. He works under a popular incentive system, earns according to his skill and ability. His precision work pays dividends all around. *Beloit Iron Works, Beloit, Wisconsin.*

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WELDING FITTINGS

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* PRESSED and WELDED

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Cooper offers a complete line of Stainless Steel Welding Fittings including 45°, 90° and 180° elbows, tees, caps, reducers and lap joint stub ends. Each are annealed, sandblasted and passivated for maximum corrosion, abrasion and heat resisting characteristics. The unusual performance of these fittings is the result of Cooper's 25 years of Stainless Steel "know-how."

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Leading paper mills throughout the country are experiencing important savings in their dryer felt costs with Woodberry 887.

Asbestos yarn woven into the face of Woodberry 887 re-enforced dryer felts, at scientifically determined intervals, protect the contact surfaces against wear, add to length of service, and reduce costs per ton of paper.

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THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

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R-S valve values

ISSUED PERIODICALLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH FLOW CONTROL AND SHUT-OFF

Corrosion and Erosion in Valves

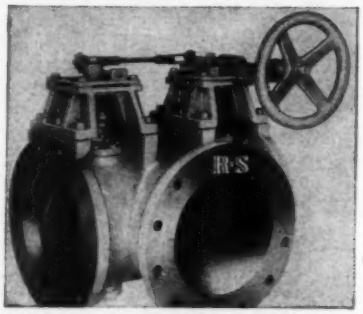
Corrosion is the major valve problem of many engineers. In the absence of any universal all-satisfying answer to the problem, R-S offers two contributions of measurable value. First is for the user who must avoid replacement and shut-down during the longest possible intervals. For such users the regular range of R-S Butterfly Valves can be had in metals of varying degrees of corrosion resistance. Thus either body or vane, or both, can be made of any specified alloy of steel, aluminum, brass, bronze, Monel metal, stainless steel, and others including R-S Products' own "A" and "H" Metals. Among these metals many acids, alkalis, and other chemicals meet real resistance to their corrosive action. Certain of the stainless steels, for example, lose as little as .00035" per month to the attack of mild solutions of sulphuric acid (more corrosive than the concentrate), and several types offer full resistance to many highly corrosive chemicals.

Some engineers hold that it is hopeless to fight corrosion; that the best policy is to surrender, buy low-cost valves, and replace frequently. For these the R-S Wafer type Butterfly Valves are a boon. They have a narrow face-to-face dimension, they are low in cost, light, easily handled, and quickly replaced. Available in all metals with free-revolving or wedge-type vanes.

Erosion is another characteristic ailment of valves against which R-S design offers advantages over the conventional type of valve. First of these is the fact that the Butterfly Valve offers minimum resistance to the flow of the material so that minimum turbulence occurs in the area of the valve. Turbulence, obviously, exaggerates the erosive effect of abrasive materials. Moreover, the vane of the Butterfly Valve is not surrounded by pockets, seats, or other impediments which contribute to turbulence. Further, the design of the Butterfly vane is such that approach to the closed position does not create a "jet" effect as in conventional valves but causes abrasive materials to "fan out" as they reach the low-pressure side of the vane.

Again, as in the consideration of corrosive action, there is a wide latitude of metals to help resist erosion. R-S "A" metal is an example of a material offering high resistance to erosion. "A" metal is a tough, dense metal of uniform grain and high endurance limit, resistant to galling, wire-drawing, and abrasive materials.

Another highly abrasion-resistant metal is the new high-Brinell Stainless Steel developed by R-S Products' engineers. This shows a Brinell figure of 1050 at 70°F. and 540 at 1100°F. as compared with corresponding figures of 170 and 121 untreated.



R-S Type 630. "H" Metal 3-way Butterfly Valve with R-S heavy duty handwheel control, self-locking worm and gear and cross-linkage mechanism. Valve has two vanes, one normally closed while the other is open.

"A" Metal Case History

Illustrating the advantages both of R-S "A" metal and the butterfly type of valves is an installation in a line leading to a condenser and used for shut-off under 70 pounds pressure. Previous installations of conventional type valves had to be replaced every six to eight months as the abrasive action of the fluid in the form of a high pressure "jet" wore a hole through the casting. The length of service was tripled by using an R-S Butterfly valve made of "A" metal.

It was demonstrated that in the butterfly valve even abrasive materials "fan out" into a crescent shaped spray when the vane approaches a closed position, rather than forming a "jet" as in other types of valve. This characteristic, aided by the dense, tough R-S "A" metal produces notably good results under the hard wear and severe stresses of this service.

"A" metal is being specified in many R-S Butterfly Valves for pressures up to 900 p.s.i. under exceptionally rigorous conditions of service.

R-S Sanitary Valve for Canning and Food Industry

Specially designed for Canning and Food industries. 2½" R-S Stainless Steel Butterfly Valve with American sanitary threads. 150 p.s.i. Heavy duty hand-lever assembly. Available in 18-8 Stainless (Type 302-304) and in 18-12 Mo Stainless (Type 316).

Shut-off 100% Complete —and it Stands up!

The R-S rubber-seated valve is available for service at all temperatures between —20°F. and plus 200°F. Dead tight shut-off is attained by the action of the bevelled vane against the rubber "spool," seat, or liner. The spool is made of a specially developed rubber, molded to fit the body, but almost loose in fit and easily fitted by hand, without tools.

As the vane approaches the closed position, a bunching of the rubber takes place at the shaft-bosses assuring dead tight shut-off at these critical points as well as around the periphery of the vane.

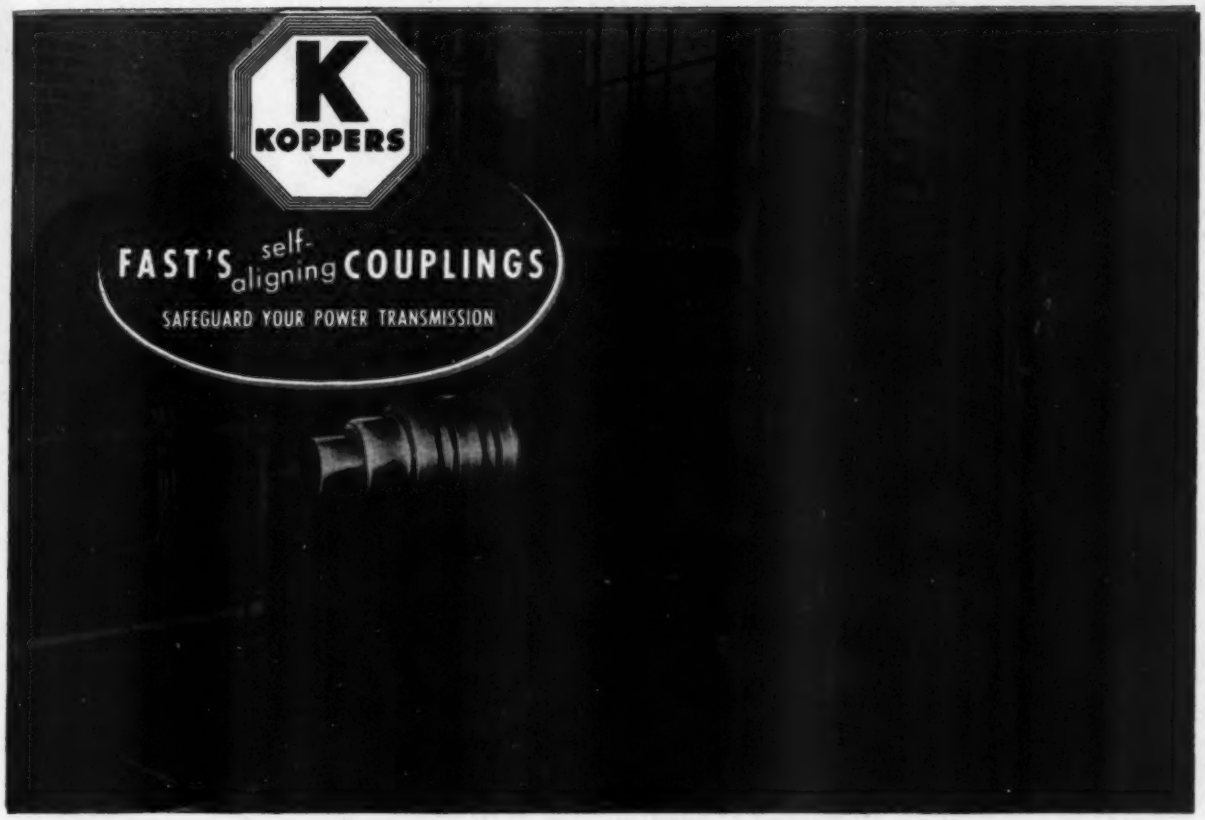
Test runs involving as many as ten thousand complete openings and closings have left R-S rubber-seated valves unimpaired as to closure. Some purchasers buy a spare rubber-spool for every three or four valves, but none has yet been needed.

The flanges of the spool are pierced to match the valve flange bolts and serve in place of the gaskets usually required.

Complete R-S Valve Installation Data

Engineers like the complete dimensional data supplied for R-S Butterfly Valves. Dimensions are tabulated by standard sizes under stock types and identified by letters corresponding to detailed drawings which accompany the tables. Six full pages of R-S Products' Catalog No. 14-B (copy on request to R-S Products Corporation, Wayne Junction, Philadelphia 44, Pa.) are devoted to this basic installation data.

JMLco P-LL?

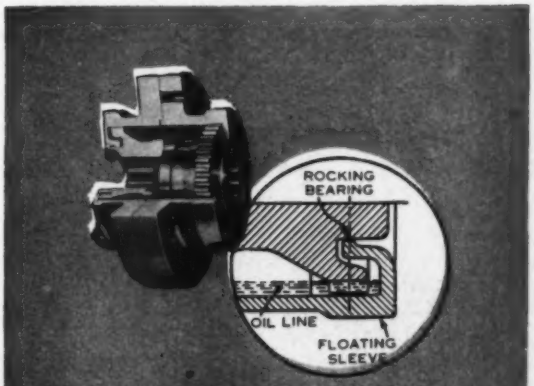


The *first* Fast's Telescopic Coupling ever installed *is still on the job!*

Way back in 1922, a paper company in Wisconsin bought the first Fast's Telescopic Coupling ever made. It was installed on a Jordan, driven by a 150 HP, 360 r.p.m. motor. Later the original machine was sold, and the coupling installed on another Jordan.

After 24 years of service, averaging three hundred and thirty 24-hour days per year, this pioneer coupling is still doing its daily job just as when it was first installed. The engineers did not report a single repair or replacement or a minute's shutdown due to the coupling. A total of thirty Fast's Couplings are serving in this one plant.

Records like this are the best possible guide in specifying couplings for *your* new equipment. Ask for a catalog, giving full dimensional information, with instructions on selection and ordering. Koppers Company, Inc., 200 Scott Street, Baltimore 3, Maryland.



Here you see the features that give Fast's Couplings their remarkable dependability. All parts are protected from wear by a positive film of oil. Oil purity is guarded by rocking bearings, located in the one position where they maintain a positive metal-to-metal seal. There are no perishable parts in "Fast's."

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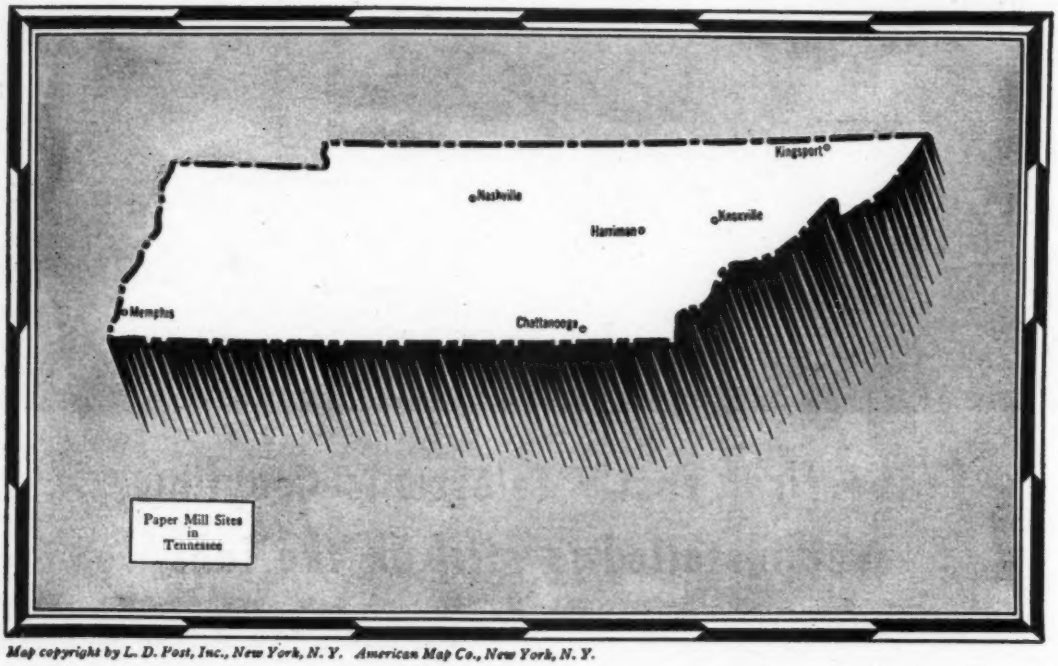
Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 23 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS



Map copyright by L. D. Post, Inc., New York, N. Y. American Map Co., New York, N. Y.

HIGH LIGHTS: Tennessee began papermaking at an early but uncertain date in the nineteenth century. The mill was set up by W. S. Whiteman four miles from Nashville, the equipment having been hauled by wagon from Philadelphia, where Whiteman had learned his trade as papermaker.

The State legislature passed bills both in 1809 and 1811, according to Weeks' *History of Paper Manufacture*, wherein it is also stated that although six mills existed in 1840, there were but two left by 1860.

There has, however, been a revival of pulp and papermaking in more recent times, with a notable growth in the production both of soda pulp and of chemical cotton pulp, which together exceed the production of paper and paperboard in this State. Book paper, chip and boxboard and roofing felt comprise the paper products of Tennessee, from six Fourdriniers and seven cylinder machines.

Draper Felts for Efficiency

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Woolen Manufacturers Since 1856

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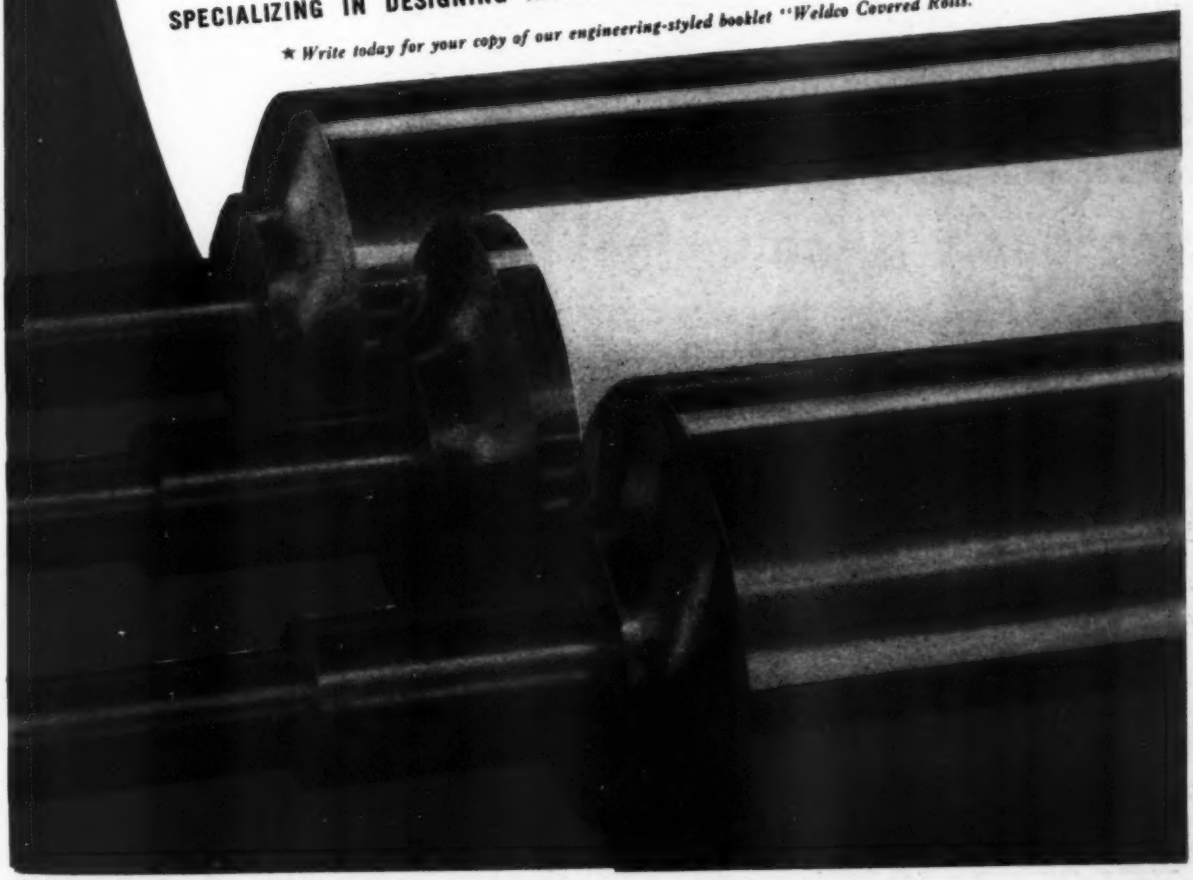

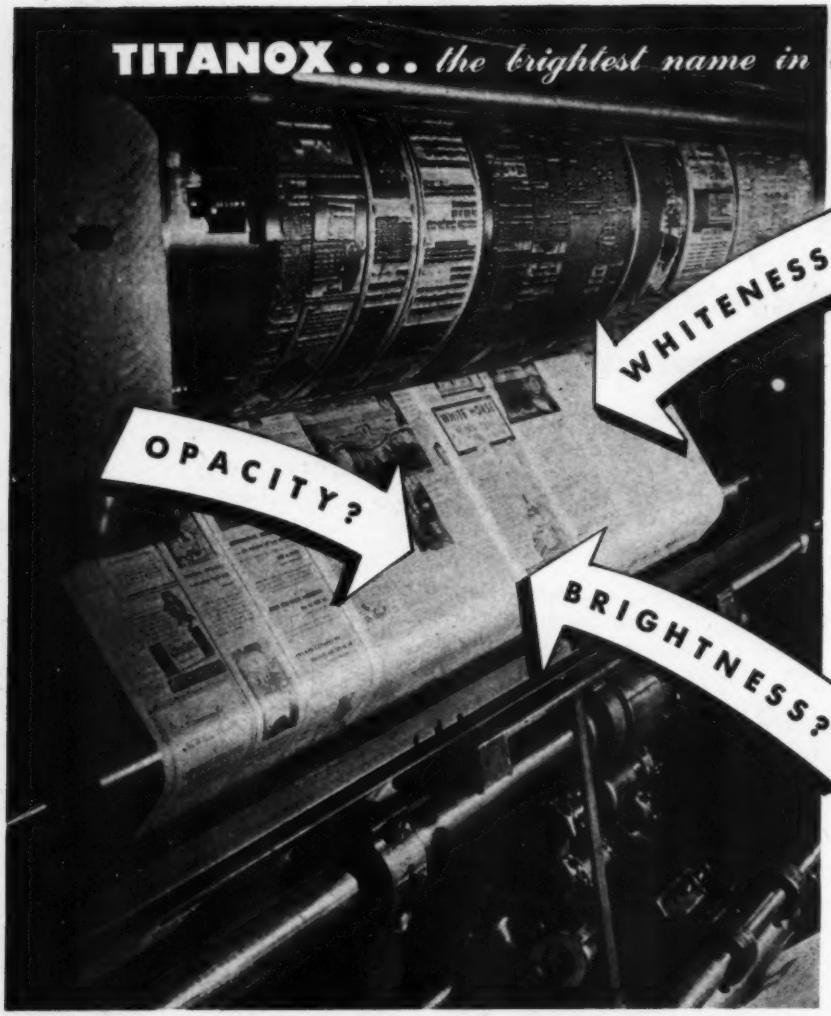

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There's a TITANOX pigment to give each paper in your line the proper degree of opacity, whiteness, brightness.

Made in various types to do a particular job for a specific paper product, TITANOX is, for example, especially employed to prevent "show-through" in all printing, business and packaging papers. TITANOX also imparts the desirable qualities of whiteness and brightness to such "heavies" as patent coated board, milk containers and butter cartons.

A little TITANOX goes far. So great is the whitening, brightening and opacifying strength of these pigments that desired results are obtained with only a minimum of pigmentation.

The paper-improving properties of TITANOX created a demand that now exceeds the output. If you find there isn't enough TITANOX to fill your needs, remember this: The makers of TITANOX are doing their best to increase production to make your wait as short as possible.

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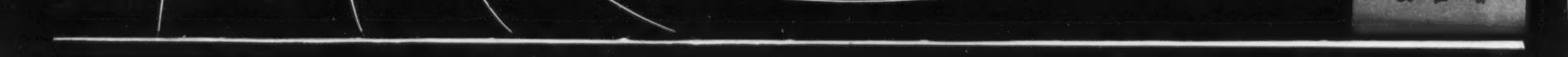

ARE YOU SHORT OF POWER

IN YOUR MILL? IF SO

SUTHERLAND

Continuous

BEATING AND

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CAN HELP, BY SAVING

SOME OF THE POWER YOU NOW HAVE

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TRENTON, NEW JERSEY • • *Manufactured in the United States by Valley Iron Works Co., Appleton, Wis.*

SUTHERLAND REFINER LIMITED, 339 DRUMMOND BLDG., MONTREAL P.Q., *Manufactured in Canada by The John Bertram & Sons Co. Ltd., Dundas, Ontario*

Printers frequently find it necessary to put their paper through a series of operations similar to those to which the manufacturer has subjected it at the paper mill.

They either "condition" it by storing it in a moist atmosphere or by humidifying the air in the press room by a continuous spray of water. This restores some of the moisture that was cooked out at the driers.

After the printed sheets leave the press they are passed over flares of flame to hasten drying. This is difficult, dangerous and costly. To render it unnecessary the manufacturers of the finest printing papers equip their machines with Hamilton Felts.

Hamilton Felts remove so much water at the couch that little direct heat is needed to complete drying. The resulting paper retains enough moisture to reduce the necessity for humidifying at the printing plant. Its surface is ideally adapted to close registry printing of the finest screens and for natural drying of the inks.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

One-Man Operated

AIR CONTROLLED

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- AIR-OPERATED CLUTCHES
- SAFETY HOIST BRAKES
- BALANCED WEIGHT
- SIMPLE, POWERFUL DESIGN
- EIGHT MODELS

WITHOUT fatigue, and all day long, *one man*, with an Aero-Crane, does the work of 4 or 5 men—gets your material onto the stockpile and out again at minimum cost. With the Aero-Crane one man handles 200 to 1000 lb. loads that eat up the time of a yard crew.

Designed for rapid yard work, the Aero-Crane goes anywhere a truck can go. You can travel it light or loaded with boom in any position. Tough-built, with anti-friction bearings throughout, electric welded construction, non-burn clutches, Air-controls, Aero-Crane keeps going free of breakdowns—pays for itself in saved man-hours.

Built in a range of eight models. Capacities of 3,500 to 60,000 lbs. at 12 foot radius. Diesel or gasoline powered.

CATALOG 73 GIVES THE DETAILS. SEND FOR IT.

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POWER

ORTON CRANE & SHOVEL CO.

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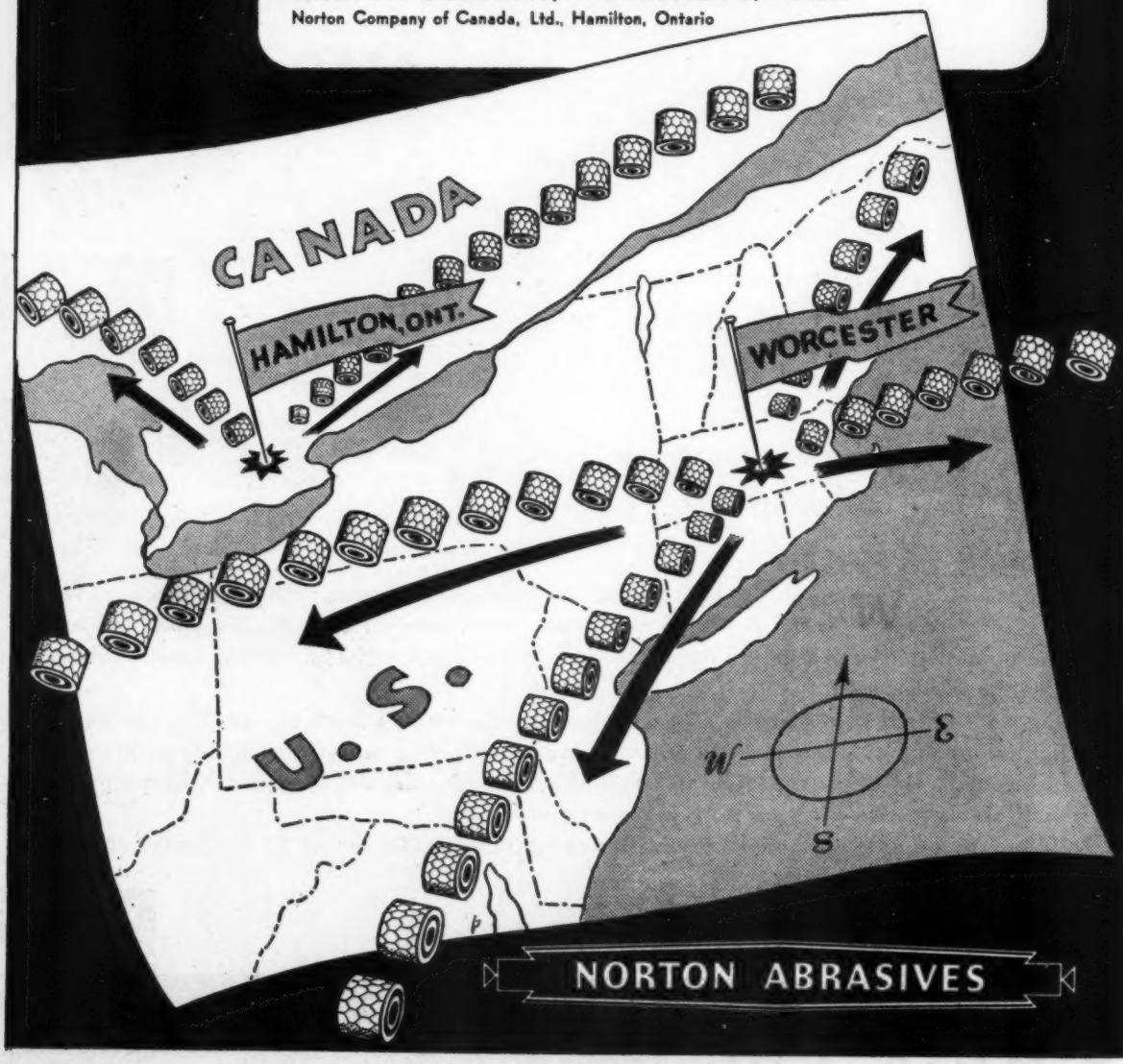
More PULPSTONES *than ever!*

Yes . . . the demand for Norton Pulpstones is greater than ever. From the main Norton plant at Worcester and from the Canadian plant at Hamilton, they are being shipped at the greatest rate in their history—throughout the United States and Canada, to Mexico and South America, to the Scandinavian countries and to many points in the British Empire.

Pulp-mill operators everywhere depend on the Norton Pulpstone—the original manufactured stone—the stone backed by over twenty years' manufacturing experience and application experience.

And the fact that there are two Norton plants, each supplementing the other, assures uninterrupted service.

NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada, Ltd., Hamilton, Ontario



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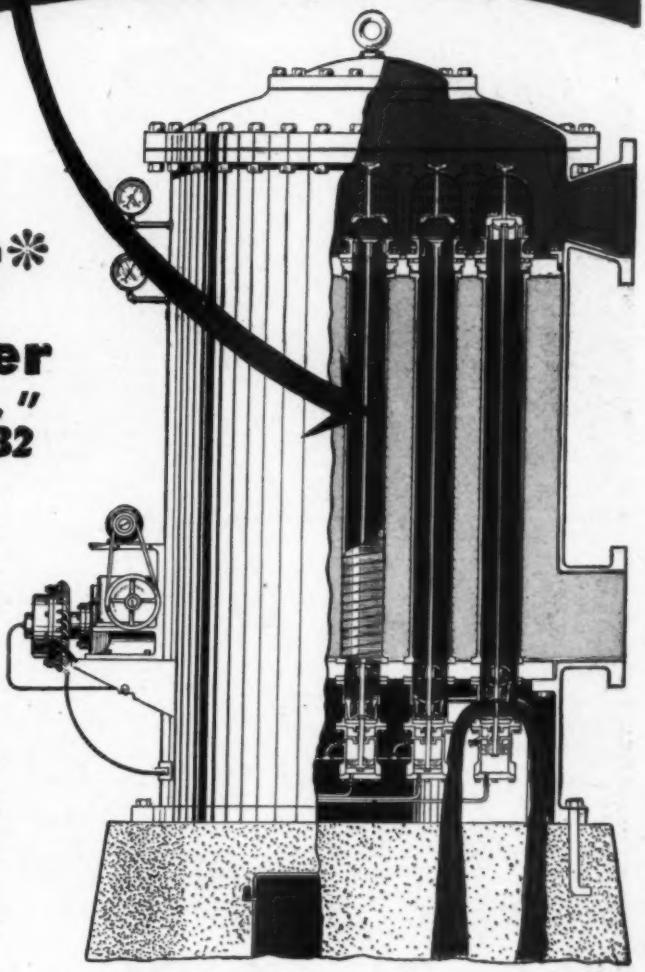
Remove GRIT and DIRT* from River Water

***15 times finer than 1/32"**

Adams *Poro-Screen* Filters offer a practical answer to large-scale filtration of dirty river water for use in hydraulic equipment. Designed for continuous, automatic operation and requiring a minimum of attention, Adams Automatic Filters supply the required volume of clean water for your operations—water free of dirt and grit which damage bearings, rolls, valves and other equipment. Highly successful on water cooling installations of open-hearth and heat-treating furnaces.

Adams Automatic Filters provide low velocity filtration. Their multiple tube design has no moving clearances, is fully automatic. One tube is back washed at a time while filter is delivering full rated capacity. Adjustable control gives flexibility of back-washing—excessively dirty water more frequently, normal water less frequently. Built in four sizes from 300 gpm. to 2000 gpm. Write for Bulletin 901.



★ R. P. ADAMS COMPANY, INC. ★

81 Chicago Street, Buffalo, N. Y.

PORO-STONE
AND
PORO SCREEN

Each generation leaves to the world the knowledge it has gained and all that it has built—thus the world we live in today benefits from all that has gone before.

"We Thank Thee!"

Today this nation is confronted with problems of living; there is confusion, the aftermath of a great conflict, which temporarily slows the progress of industry. But through it all shines the cheerful thought, "This, too, shall pass."

On this Thanksgiving Day the people of our nation should feel a broader sense of thankfulness than ever before. The source of man's blessings remains immutable, and the freedom which is the birthright of every American is staunch and victorious. For the blessings of Victory and the heritage of Thanksgiving Day let us be thankful with renewed spirit to help keep our nation free from corruption—that its people may live in a changing world that is progressing, but where one thing may continue uninterrupted and unchanged—the daily supplication, "We Thank Thee!"

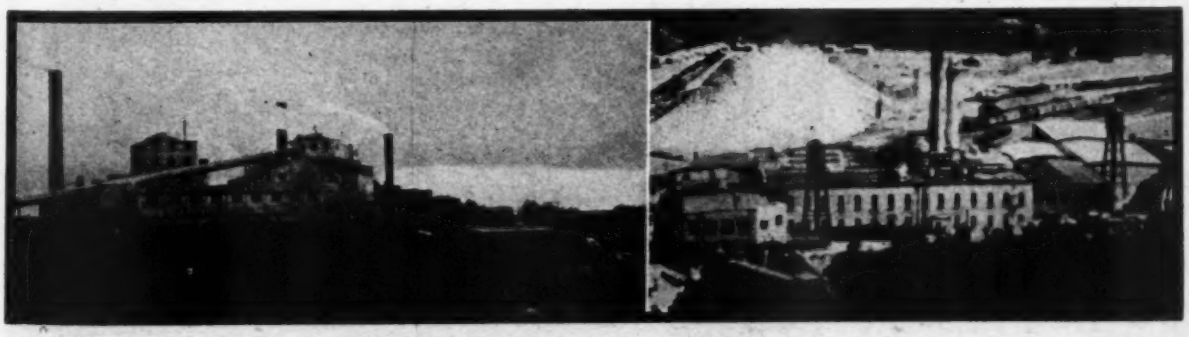
TRADE WINDS

KVP Converts Long-Idle Canadian Mill for Pulp Production

View of new pulp mill at Espanola as seen from the River

▶▶▶ THE PHENOMENAL growth of the Kalamazoo Vegetable Parchment Company, Parchment, Michigan, necessarily required an increasing number of connections from which the company might be assured of a sufficient supply of pulp to meet its need for raw material. Pulp was imported from Scandinavian countries and from Canada; some pulp was obtained in this country. Because of this situation, the company was confronted with a sliding scale of pulp prices which resulted in a variation in costs.

Like other problems that had come up during the life of this organization, this one was carefully analyzed. Early in the year 1940, an estimate of the company's pulp requirements revealed that a minimum of 250 tons of pulp per day would be needed to maintain production. The company, therefore, reached a decision that in



LEFT—Side view of the pulp mill from top of falls. Chips move into pulp mill on long conveyor through steel tube. Power house is in foreground at right. RIGHT—The four-machine paper mill

order to be assured of a sufficient supply of pulp at stable prices, the next move would be to acquire its own pulp mill.

The beginning of the war made this step more imperative. The search for a suitable plant naturally was directed toward areas where pulpwood was in ample supply. An investigation that lasted two years took the searchers into parts of the United States and over into Canada.

At Espanola, Ontario, on the Spanish River and not far from the shore of Lake Huron, was a mill owned by the Abitibi Company. Because the supply of spruce timber in the area had been exhausted, the mill which had manufactured newsprint had been idle since 1930. When the plant closed down, the town of Espanola became a veritable "ghost town."

Because the location was strategic —it was less than 500 miles from Kalamazoo—and because a large supply of jackpine grew in adjacent timber limits, the KVP company believed this plant could be adapted to its requirements.

The proposition was considered from every angle and the conclusions were favorable—the plant could be rehabilitated and equipped to manufacture sulphate pulp.

The search was ended, and after formalities with the Canadian Government were handled, the property was purchased from the Abitibi Company in January, 1943. The multiple restrictions of wartime caused the work on this plant to progress slowly. Plans called for converting the plant into a chemical pulp mill; a bleaching plant would be required for the making of bleached sulphate pulp; it would be necessary to establish a complete organization of woods operations in order to insure an adequate supply of pulpwood; and the town required rebuilding and repairs.

Millions of dollars have gone into the Espanola project which progressed slowly for a time, but steadily, and on April 1, 1946, the Canadian company was officially incorporated as The KVP Company Limited. The first groundwood was made January 29, 1946, followed on May 17 by the first run of chemical pulp. The bleaching plant is practically completed.

In a souvenir brochure distributed to commemorate the starting of the pulp and paper mill at Espanola, the Kalamazoo Vegetable Parchment Company has published an interesting historical skeach of Espanola, which is singularly interwoven with some early associations of R. A. Hayward, president of both the Kalamazoo Vegetable Parchment Company and The KVP Company Limited. This fascinating story has been excerpted from the brochure as follows:

Historical Sketch of Espanola

On April 1, 1946, the Canadian company was officially incorporated as The KVP Company Limited. It is the third corporation to operate a pulp mill in Espanola. The original incorporation was in 1899 under the name of the Spanish River Pulp Company, The dam was built in 1901 and the pulp mill construction started.

The first groundwood was produced in September of 1905. The company store was opened in October of that year. In 1910 there was a reorganization of the company; the mill at Sturgeon Falls was consolidated with the Espanola plant.

The paper mill was built in 1911 and started in production in July, 1912, with two 166" Pusey & Jones machines. The hotel was built that same year.

In 1914 two 122" Rice, Barton & Fales machines were added to the

The illustrations used with this article appear through the courtesy of Kalamazoo Vegetable Parchment Company

Above—Stacker fed by conveyor from log pond

Right—A 75,000-cord wood pile, well protected by fire hose towers

PAPER · · · America's 6th Industry

"WINDOW" BAGS FOR PERISHABLES

(NOTE: *Several chain grocery organizations are pre-packing fresh produce in specially developed paper "window" bags before it reaches neighborhood stores.*)

A new type of Kraft paper bag with a "window" of cellophane is revolutionizing the merchandising techniques for fresh fruits and vegetables. Produce is placed on store counters—packaged, weighed and priced—ready to be picked up by shoppers. Savings as high as one-third are effected through the elimination of handling, shrinkage and spoilage. Buyers can judge the quality of their purchases through the cellophane windows.

Reprint of a 600-word article describing this new paper product is available for the asking.

Paper sheets . . . paper pillow cases . . . paper wash cloths . . . paper draperies . . . new uses for paper calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines.

Among the new machines under construction by Puseyjones are three of the largest and fastest Fourdrinier Machines, one for book and high grade printing papers, one for white paper for bags, and one for Kraft liner board; also one Cylinder machine of record size and speed for the manufacture of floor covering felt. Other machines are under construction for M. G. Kraft specialties, facial tissues, and high grade bristols.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

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Established 1848. Builders of Paper-Making Machinery
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equipment. These machines were purchased from the Riverside Paper Company in Wisconsin.

During the first World War plans were made to enlarge the paper mill and two new Pusey machines were put in operation in 1919. Two new schools were also built to take care of the growing needs of the community.

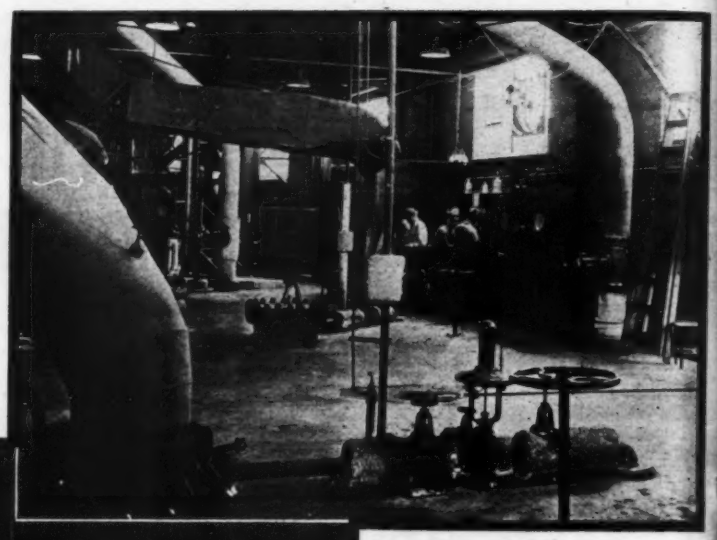
Many new houses were built during the years of 1919 and 1920. The original homes were built of clay taken from the excavation of the power canal and made into brick in Espanola.

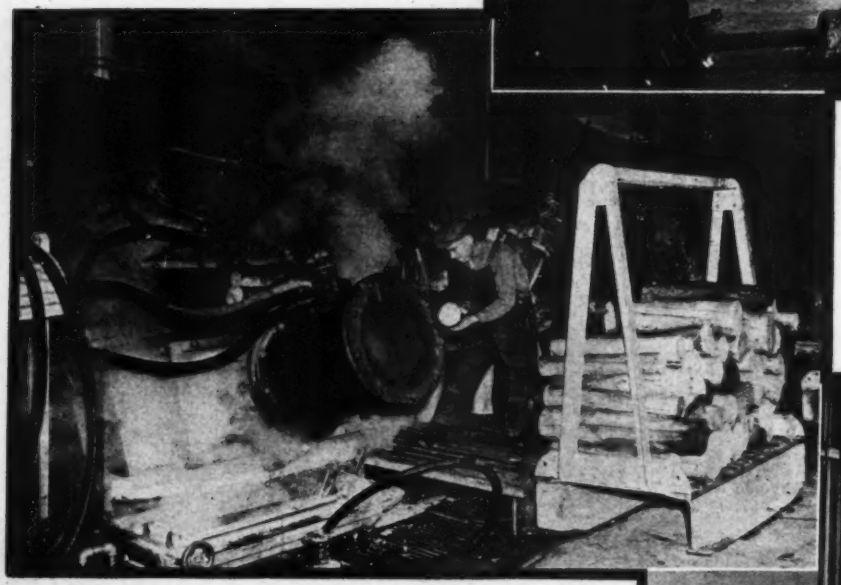
One of the major reasons for settling on the Espanola purchase dates back to 1917. In that year a young man just out of the University of Michigan started work in Espanola as the first resident engineer. At that time Mr. R. B. Wolf was manager of the Spanish River Company. Following the first World War he continued his association with Mr. Wolf in the consulting engineering field. His name is R. A. Hayward.

In 1924 he joined the KVP Company as general manager and became its president in 1936, succeeding Mr. Kindleberger who became chairman of the Board. It was only natural, therefore, that his thought should return to Espanola in the consideration of a location of a pulp mill.

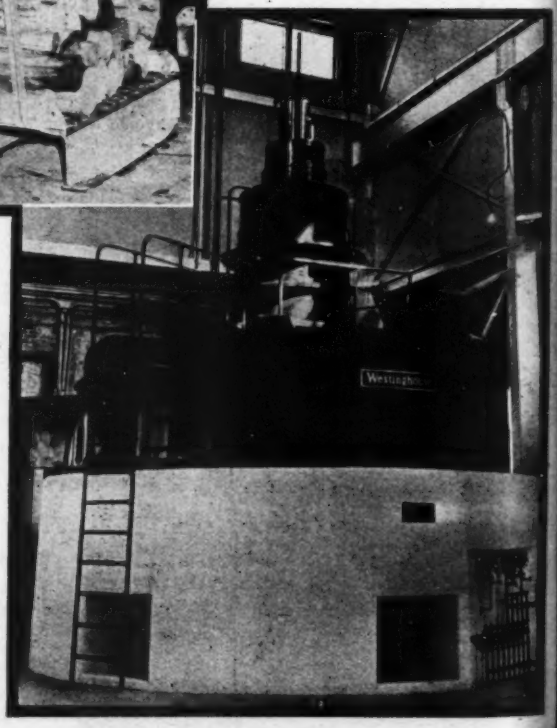
Back in 1917, for a short period of time, he had lived at the Y.M.C.A. at the Soo with Ben Avery, then starting in the forestry department of the Spanish River Company. On many occasions Ben had mentioned the fact that the engineers and chemists should work out some way to utilize the jackpine on the property. When Espanola was under consideration for the building of our pulp mill, Mr. Hayward visited Fort William and discussed in detail with Mr. Avery the wood resources, particularly the jackpine, standing on the timber limits.

Mr. Avery had remained with the Spanish River Company and then the Abitibi Company until 1937 and was thoroughly familiar with the wood available on the limits. Mr. Avery continued his interest in the development of the company and assisted in the selection of the personnel that would





Above—Cooking floor at top of digesters. Large pipe at left charges digester with chips



Above — Battery of grinders for groundwood mill

Right — 10,000 horsepower from a mammoth turbine

MORE REASON why Seybold "Sixty" Mill Trimmer and Spacer Operators are

MISERLY WITH MOTION

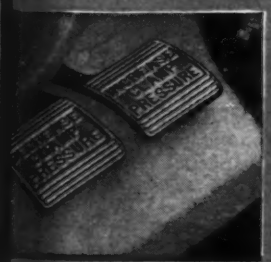
SIMPLE, QUICK KNIFE ADJUSTMENT: A turn of the knurled collar on pull bar adjusts knife to cutting stick. No tools are necessary. Self-locking. Adjusts to the thickness of one sheet.

Simple, quick knife adjustment is just one more reason why mill trimmer and spacer operators are saying of the new Seybold "Sixty"—"that's the machine for me".

Recognizing that certain adjustments, such as changing clamping pressure and resetting the knife, can never be eliminated, these and other tasks have been greatly simplified. The efficient, new line of Seybold "Sixty" Mill Trimmers and Spacers have been designed to conserve the operator's time and energy by helping him to be miserly with motion. In the long run, this spells greater productivity . . . greater tonnage.

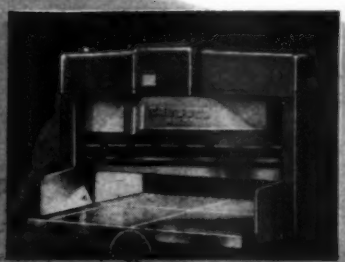
Today, Seybold Mill Trimmers and Spacers are faster, safer and more accurate —are more efficiently lubricated and maintenance has all but disappeared.

Get all the facts from your Harris-Seybold representative.

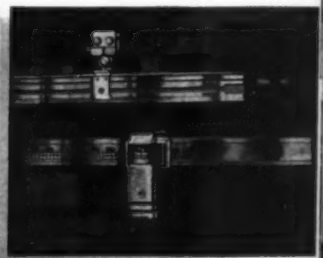


LLED BY FOOT PEDALS: A ...mping motion changes clamp-...re instantly. No tools are need-...e time. Saves energy. A shadow ...gisters the pressure reading.

EASILY LUBRICATED: Zerk fittings are provided for cleaner, easier, more permanent lubrication. Lubrication points are out in the open, encouraging more thorough lubrication.



FLOODLIGHTED TABLE AND GAUGE—MAGNIFIED MEASURING BAND: Less operator fatigue. Greater safety. Less chance for errors. Greater production of more accurately trimmed work.



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form the executive staff. On the first of April he joined the company as vice president and general manager. Thus after nearly thirty years of separation, Mr. Hayward and Mr. Avery are again working together in Espanola.

In 1925 the mill began to make water shipments from Little Current. Three years later, in 1928, the Spanish River Company was consolidated with the Abitibi Power & Paper Company which operated the mill at Espanola until 1930. Business was then in the midst of world-wide depression. Other Abitibi plants with better wood resources and lower costs were able to take care of their sales, and the mill was shut down. A competent maintenance crew was maintained to keep the property in excellent condition.

Many of the families moved out of the town and, of course, the houses depreciated a great deal during this time. News that the mill was to be revived and made even larger brought a thrill to the people almost beyond belief. It seemed like nothing short of a miracle. A brief flurry of prosperity had occurred early in the war when the government had taken over the plant for a prison camp. Some 1200 prisoners from the German air force and submarine crews were housed in the old finishing room and warehouse. There was almost a like number of Canadian veterans to guard them. The incident will remain long in the memory of those who witnessed it with the attempted escapes and all the excitement of enemy aliens.

But that was an artificial stimulant. The KVP purchase was real; it had flesh and blood and sinew. Espanola was reborn in mind, body, and spirit. It is on its way to become a model mill and city—an outstanding example of what men and money working together can do to make a better world.

The mill will produce 200 tons of bleached sulphate pulp daily, plus some groundwood. Most of this pulp will go to Parchment. Some will be used in Espanola for papermaking. Two of the paper machines will be placed in operation in the early part of 1947. The bulk of this paper will be shipped to the company's plants at Hamilton and Montreal for conversion and distribution in the Canadian market and for export.

KVP Was Organized Thirty-six Years Ago

▶▶▶ THE INDUSTRIAL EMPIRE, over which floats the flag of KVP now represents assets of more than $28,000,000. This organization had its beginning thirty-six years ago when a resolute young man with a clear vision and undaunted courage chose Kalamazoo, Michigan, as a suitable location for establishing a business he had visualized—a plant for the manufacture of genuine vegetable parchment.

Jacob Kindleberger had faith in the future, and with the aid of a few associates who shared his confidence, $50,000 was raised and the company officially formed on October 27, 1909. The first parchment made by the company was processed in an abandoned sugar beet factory located on the bank of the Kalamazoo River, and the men who believed in the future of that business endured many privations and hardships during the early days of the new company.

The story of the growth of this company has been told many times, but it never ceases to be an inspiration. This fine, modern plant, which has been called "The World's Model Paper Mill," now produces such a variety of papers and specialties they can hardly be enumerated. They may, however, be classified into four major groups: (1) food protection papers; (2) household papers; (3) fine or printing papers, and (4) converting papers, with a number of special papers making up a miscellaneous group.

Inevitably such faith as remained firm during the growth of this organization is rewarded, and today as one drives along the modern highway which winds around the Kalamazoo River, the stack bearing the letters KVP rises from the industrial expanse that stretches off into the distance, pointing upward—truly an inspiration to the young men of industry.

For several years past the company has been expanding, and it chronological growth as prepared by the company's own staff is as follows:

1909—Kalamazoo Vegetable Parchment Co. (Parchment Div.), Kalamazoo, Mich.

1910—Waxed Paper Division

1918—No. 1 Paper Mill

1923—No. 2 Paper Mill

1938—No. 3 Paper Mill — KVP Company of Texas, Houston, Texas

1939—Kalamazoo Vegetable Parchment Co., Philadelphia—Devon—Pa.

1943—Harvey Paper Products Co., Sturgis, Mich.

1845—Appleford Paper Products, Ltd., Hamilton, Ontario—Montreal, Quebec . . . Aridor Ltd., Hamilton, Ontario

1946—The KVP Company Limited, Espanola, Ontario

Jacob Kindleberger

Ralph A. Hayward

OFFICERS

Kalamazoo Vegetable Parchment Company

Chairman of the Board—J. Kindleberger

President—R. A. Hayward

First Vice President—A. Southon

Second Vice President—H. H. Jones

Third Vice President—J. B. Kindleberger

Secretary—Thos. W. Peck

Assistant Secretary—William R. Hess

Treasurer—C. S. Campbell

The KVP Company, Limited

President—R. A. Hayward

Vice President—B. F. Avery

Secretary—E. Norval Hunter

Treasurer—Thos. W. Peck

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Survey of Planned New Papermaking Capacity for the Years 1947 and 1948

▶▶▶ The survey presented herewith is tabulated from reports received from 188 companies giving proposed additions to their papermaking capacity during the years 1947 and 1948 (Table 1). The data from these reports have been consolidated with that from the report on new installations of paper machines for the year 1947 from machine builders, issued by the Writing Paper Manufacturers Association. We are grateful to the mills and the Writing Paper Manufacturers Association for co-operation.

In the 1947 tabulation of new machines (Table 2) 100 per cent coverage was secured but the reported increased capacity due to rebuilding represents only the percentage of the group shown under the coverage column.

The planned new machine capacity for 1948 (Table 3) is derived exclusively from the American Paper and Pulp Association survey.

Analysis of the Report

The reported increases for 1947 are believed to be conservatively stated. The coverage ranges from 12.4 per cent of capacity for absorbent papers to 83.3 per cent for book paper. While reported new machine capacity is believed to be 100 per cent, rebuilt capacity increases as tabulated represent only the coverage shown. There is a possibility therefore that the mills not represented may be planning some increase in capacity through rebuilt machines.

Apparently the plans for 1948 capacity increases have not as yet been completed in all cases, or else the postwar burst of new capacity increases will have slowed down by 1948. It seems a trifle early to make a categorical statement as to which conclusion is correct. The data are presented as reported.

The tabulation in Table 1 represents the planned increases in new capacity beginning with January 1, 1946, as reported to the Association.

From these tabulations the conclusion seems warranted that from January 1, 1946, through the year 1948 an increase in paper and paperboard capacity of roughly 3,000,000 tons is to be expected. This expected increase, according to present indications, will occur about as follows in timing:

1946—1,000,000 tons
1947—1,500,000 tons
1948— 500,000 tons

It will be divided roughly into 1,600,000 tons of paper capacity and 1,400,000 tons of paperboard capacity.

TABLE 1—Increases in Annual Capacity (in 1,000 tons) from January 1, 1946, through 1948

Grade	1946	1947	1948	Total Postwar
Book Paper	229	218	109	556
Writing paper	74	47	5	126
Tissue paper	143	103	73	318
Kraft paper	140	164	2	306
Sulphite wrapping paper (including glassine)	9	58	51	118
Groundwood papers	35	36	3	74
Newsprint	—	29	2	31
Absorbent	—	—	—	—
Specialty paper and board	21	58	—	79
Paperboard and building papers	411	731	150	1,292
Total	1,062	1,444	395	2,900

Table 2—Report on New Capacity Survey for 1947

Grade	Capacity Daily Increases (Tons) New Machines	Rebuilt	Coverage On Rebuilt*	Total	Increase In Annual Capacity (Tons)
Book papers	335	369	83.3%	704	218,000
Writing papers	110	41	55.7	151	47,000
Tissue	323	7.5	25.1	330.5	103,000
Kraft paper	380	148	40.8	528	164,000
Sulphite wrapping (Incl. glassine)	158	30	52.4	188	58,000
Groundwood	—	115	37.4	115	36,000
Newsprint	170	75	55.8	95	29,000
Absorbent	—	—	12.4	—	—
Specialty paper & board	80	107.5	41.0	187.5	58,000
Paperboard & building papers	2,203	155	25.0	2,358	731,000
Total Increases	3,759	898		4,657	1,444,000

* Represents 100% coverage.

Table 3—Report on New Capacity Survey for 1948

Grade	Capacity Daily Increases (Tons) New Machines	Rebuilt	Coverage	Total	Increase In Annual Capacity (Tons)
Book papers	160	190	85.1%	350	109,000
Writing papers	—	15	57.5	15	5,000
Tissue	218	18	31.9	236	73,000
Kraft paper	—	7	45.4	7	2,000
Sulphite wrapping (Incl. glassine)	157	9	54.7	166	51,000
Groundwood	—	10	40.6	10	3,000
Newsprint	—	—	57.2	—	—
Absorbent	—	6	12.4	6	2,000
Specialty paper & board	—	—	45.9	—	—
Paperboard & building papers	415	70	30.1	485	150,000
Total Increases	950	325		1,275	395,000

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ST. REGIS TAKES OVER OPERATION OF BRYANT
Milham Resigns—Massey Is New General Manager

Discussing final details of Bryant Paper Company management change-over are (L to R): Peter J. Massey, the new manager for St. Regis Paper Co.; Lyman A. Beeman, New York, vice president of St. Regis and in charge of general supervision of the mill, and Allan B. Milham, retiring president of Bryant

▶▶▶ On November 1, St. Regis Paper Company took over operation of the Bryant Paper Company, Kalamazoo, Michigan. Negotiations of the transaction by which St. Regis acquired the Bryant plant from Time Inc., are almost completed (Cf. P.I. & P.W. Oct., 1946).

Simultaneous with its taking over operation of the plant came the announcement that Allan B. Milham, president of Bryant since 1942, has resigned and that Roy K. Ferguson, president of St. Regis, has appointed Peter J. Massey, of Chicago, as the new general manager of the plant.

Mr. Massey states that operation arrangements for the present interim will be continued after final legal details of the transaction have been concluded. He states there will be no change in or transfer of personnel, and that the improvements started by the former owner will be completed—that the mill will continue to be operated under the most modern and progressive policies.

As retiring president of the Bryant Paper Company, Mr. Milham ends a long association with the company. The mill was founded by Noah Bryant and his uncle, Frank Milham, and his father, W. B. Milham, was a member of the first board of directors. While still in school, Allan Milham worked part time in the plant and became a full-time employee in 1916. Except for serving in World War I, he has been continuously employed there. He has worked through many of the departments, and was manager of the coating mill in 1941, the year William J. Lawrence, then president, passed away. The first of the following year, Allan Milham became president of the company.

On June 30, of this year, Mr. Massey severed his connection with H. P. Smith Paper Company, Chicago. He had been with that company since 1940 and acted as general manager during the president's absence on war duty. Before joining the Smith organization, Mr. Massey had been affiliated with several well known paper companies, as well as the W. F. Hall Printing Company, Chicago. In his present post, he will work under the general supervision of Lyman A. Beeman, vice president of St. Regis Paper Company.

◆

HINSDALE PAPER MFG. CO. PURCHASED BY BAUM FAMILY

Ownership of the Hinsdale Paper Manufacturing Company, Holyoke, Massachusetts, which includes the Fiske Paper Mill and the White-Washburn Company, has been purchased by Isadore Baum, his wife, Sarah Baum, and his son Seymour Baum. The new owners have taken over the business from Leo Gratton, Harold R. Weeks, and Floyd Graham who acquired control of the company from Louis N. Sterns and Harold S. Garfield twenty-two months ago.

Under the new management, Isadore Baum will be president of the concern. The elder Baum has been in the paper business for forty years. Vice president of the company will be Seymour Baum, and treasurer, Sarah Baum. No changes in policy or personnel will be effected by the new owners, and the plants will continue to manufacture and convert toilet tissue and paper toweling.

Mr. Gratton and Mr. Weeks will continue with the Hinsdale organization as general manager and assistant general manager respectively; they will also operate the G. E. Robertson Company mill in Holyoke, another of their holdings.

◆

MARATHON CORPORATION TO BUILD NEW RESEARCH LABORATORY AT ROTHSCHILD

A modern research laboratory will be constructed next year by Marathon Corporation, Rothschild, Wisconsin. The announcement was made recently by D. C. Everest, president of the company. He stated that the new laboratory is a unit in an expanded program of research and development to be undertaken by the company. Allen Abrams, vice president of the company and technical director, will be in charge of the laboratory.

Mr. Abrams stated that the company will continue its extensive research to make additional products from lignin. Applied research on pulp, paper, and chemicals will be carried on in the new unit, while applied research on converted products will be conducted at the company's Menasha laboratories.

◆

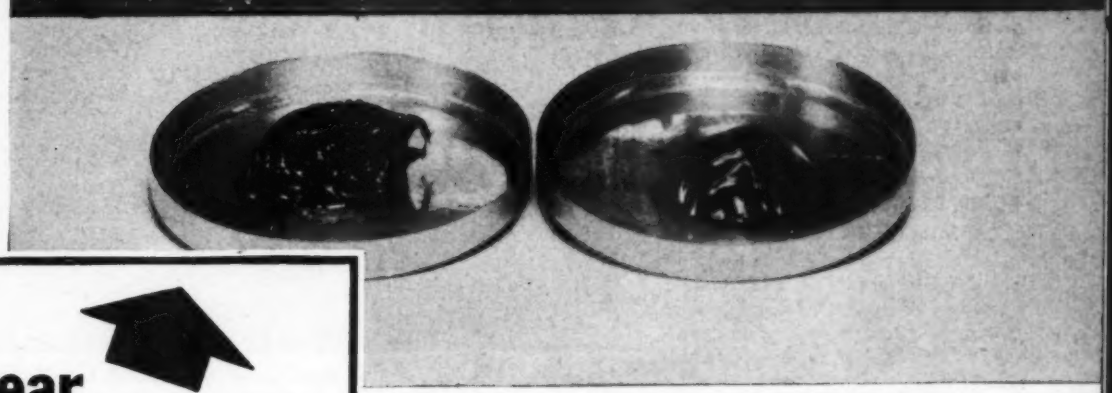
HARDWOOD TREES MEANS OF SUPPLEMENTING RAW MATERIALS FOR PAPER

Hardwood trees will be the solution to the problem of the paper industry in obtaining an adequate supply of raw material in New York State. This is the opinion of Clarence E. Libby, head of the department of pulp and paper manufacture, New York State College of Forestry at Syracuse University.

Professor Libby, who has been directing extensive research in the use of hardwood as pulp, further stated, that some of the hardwood pulps which his research staff have developed are not only satisfactory substitutes for spruce pulp but possess properties which actually improve the quality of certain specialty papers.

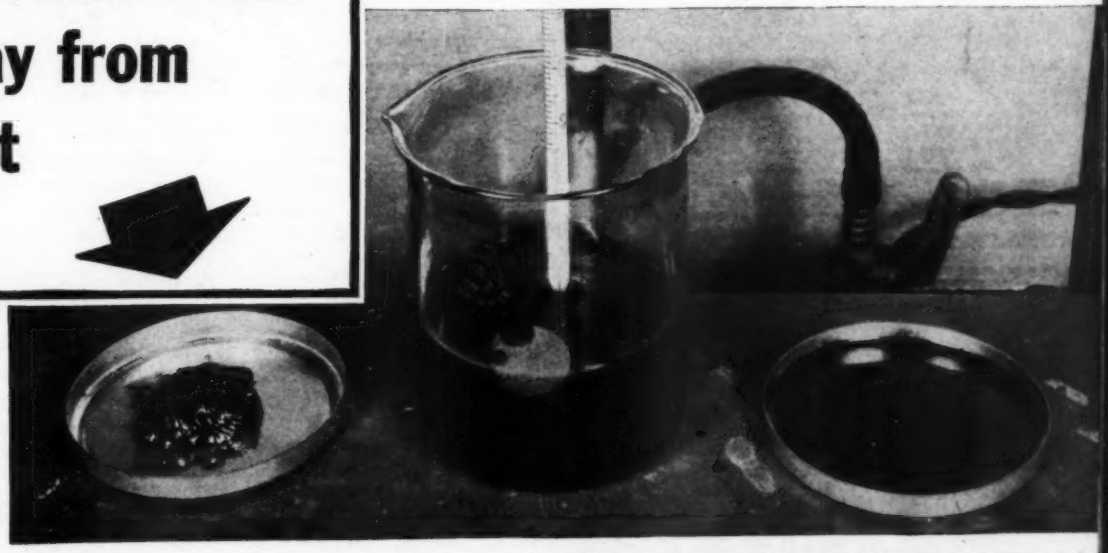
These new developments in hardwood pulping and the improved pulp thus secured are the result of months of intensive research at the college. The new developments guarantee that hardwood pulps with a widely increasing range of usefulness will soon become available to the paper industry in the northeastern states.

The problem of pulp supply from hardwoods in the northeast, and par-



A gear lubricant that won't run away from heat

(Above) Two samples of grease, Calumet Viscous Lubricant on left and a residuum type gear shield, right. These samples are placed on a hot plate (below) and heated to 320°F. as determined by the thermometer in the beaker of oil. Within 60 seconds the old type gear shield has melted and spread over the pan. There is little or no change in structure of Calumet Viscous Lubricant even at this high temperature.



THE SIMPLE TEST described here shows why Calumet Viscous Lubricants reduce throwoff, cut lubricant consumption and protect open gears for long periods of time even though subjected to elevated temperatures.

Calumet Viscous Lubricants have these qualities because they are not the old type gear shields but are true greases made from selected soaps and oils of proper viscosities. They do not require heating before application, and all but the heaviest grades can be sprayed. Both features offer a further saving in time and grease.

A Standard Oil Lubrication Engineer will help you select the grade you need for low cost open gear lubrication.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

CALUMET
Viscous Lubricants

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

ticularly in New York State, is of prime importance to the paper industry because hardwoods grow in great profusion in this section of the United States, while spruce, from which many kinds of paper is produced, has become very scarce. The scarcity has made the northeast a large importer of pulpwood and paper pulp.

◆

FOLKE BECKER CLARIFIES MISQUOTATION OF SPEECH

President of the Rhinelander Paper Company, Folke Becker, holds remarks attributed to him as advocating rigid government control to be a misquotation of his speech made before the Rhinelander Lion's Club, October 24. His statements were widely circulated in the press to the effect that he favored "rigid government control" of United States forest resources as in the case of Sweden.

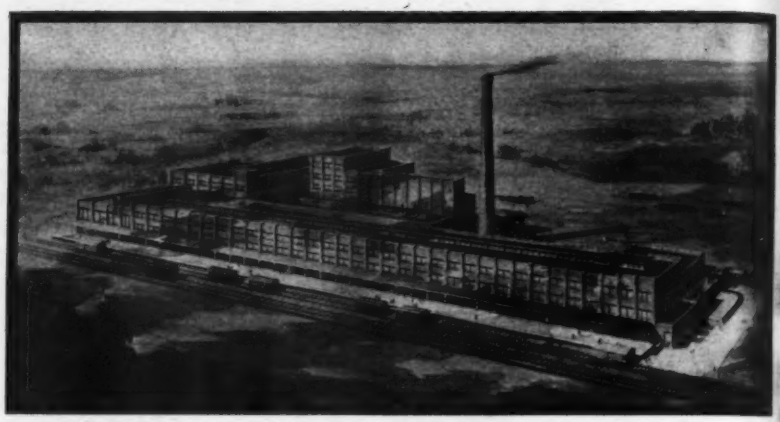
Denying he had advocated rigid government control, Becker said he believes the elimination of wasteful forest practices is a matter for state and local action. He asserted he had told the Lions' club that he felt Sweden had gone much too far in its government control of forests, and that it was his belief national legislation would be unwise and inefficient because of differing conditions in various parts of the country.

◆

ITALIAN PAPER NOTES (September, 1946)

Activity in the Italian paper industry has been hindered by difficulty in obtaining pulp and paper imports which are subject to fluctuations in the foreign rate of exchange. During the first quarter of 1946, only 25,000 tons of pulp reached the papermakers of Italy, an industry which requires an estimated 200,000 tons. Consequently, paper production level remains low, 15 to 20 per cent of normal; and conditions are further affected by fluctuations in the paper and cardboard market. Exception to the difficulties apparent in the over-all picture of the Italian industry is the manufacture of newsprint. Sales quotients in this phase of paper production were fairly satisfactory, 1,400 to 1,500 tons of newsprint were marketed in northern Italy and approximately 1,000 tons were sold in the central and southern sections of the country.

Book paper which is used in schools constitutes the only stable output of this kind of paper. Production of book paper for other uses has stopped almost entirely. Also, production of ledger and bond paper for general and commercial and office use is limited to about 30 per cent of estimated requirements. Paperboard and kraft which are used in the packaging industry has reached a level of 9 to 10 per cent of that produced in other times. Despite reductions in the price of paper which varies from 10 to 17 per cent for common types and from 40 to 50 per cent for finer grades, prices remain generally high. What reductions have been apparent have been made from lowering production costs rather than from an increased demand in a steadily heavy market.

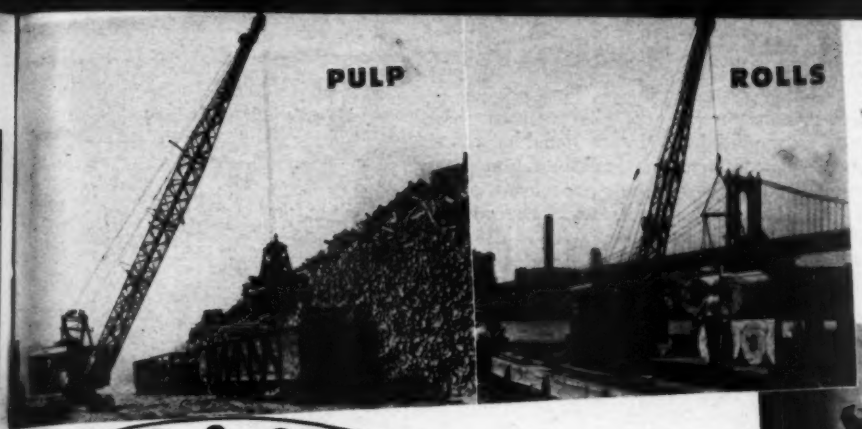


Perspective drawing of new kraft board mill now under construction at Macon, Georgia, for the Macon Kraft Corporation. The plant is being erected by James Stewart & Co., Inc., from plans by George F. Hardy, consulting engineer. The Macon plant will utilize kraft board to be manufactured at the new $10,000,000 plant to be built in Macon by The Mead Corporation (Cf. P. I. and P. W., March, 1946)

Expected imports from Sweden, when allowed to reach Italian papermakers, will materially assist in increasing production of certain grades of paper and will contribute to the further reduction of prices. This will enable an equalization of Italian paper prices compatible with the prices of foreign producers. The availability of small amounts of imported raw materials will solve temporarily the production and cost problems faced by Italian industrialists, and for this reason investigations into foreign export markets to arrange a greater flow of raw materials to Italian paper producers are a continuing process. In spite of irregularities in the foreign rate of exchange, it is believed that should the imports of Italy be handled on an exchange of products basis opportunity would arise favoring export of American raw materials and unfished paper stock.

The Italian industry is especially interested in re-establishing commercial exchange with Canada, since Canadian resources allow a large export trade of paper raw materials; and, since paper manufacturing and conversion plants in Italy, despite wartime damage, are in a position to consume the Canadian raw materials, should a commercial accord with Canada be arranged, it would prove mutually beneficial. Chemical pulp, mechanical wood pulp, and pulpwood, all among prewar imports, and now in greater demand, would assist the rehabilitation of the Italian industry. In return, Italy could produce 100 tons of cigarette paper packaged in small booklets at a value of twenty-five million lire, as well as re-establishing in quantity the production of its traditional exports of tissue paper, banknote paper, art paper, cardboard substitutes for leather, and presspan cardboard. The export of these kinds of paper prior to the war was seriously hampered by German production, and competition, in the foreign market, especially in Portugal. In the absence of sufficient German industrial capacity to produce these goods, Italian exporters anticipate profitable future in the vacated markets. Consent has been requested from the Italian Ministry of Foreign Commerce to make available 70 tons of cigarette paper, and other paper, cardboard, leather substitutes, and skins valued at 50 million lire.

Problems relating to the recovery of Italian paper industry extend to other phases of the graphic arts affecting in particular the printing and publishing businesses. Difficulty in obtaining printing ink has arisen contributing to a large price increase, in some kinds of inks even reaching thirty times its prewar cost. Limitations imposed by printing ink manufacturers contribute further to the rising price of their product. Production has been curtailed to one half and one quarter its former level, and some manufacturers have turned to the making of graphic arts accessories other than inks.



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There is a size for every Mill—4 to 44 tons capacity. Now is the time to be planning ahead. Let us send you complete details.

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The Crane that Goes Anywhere

NORTHWEST

4 to 44 tons

This retrenchment is due not only to the unstable price of books, but also to the wartime destruction suffered by the graphic industry. In the town of Milan, where 1,160 companies engaged in the graphic industry before the war, now only 700 of the firms are in operation. These factors, together with scarcity of materials and the high cost of raw materials such as lampblack, linseed oil, and pigments engenders a correspondingly high cost in the finished item. However, should the situation affecting the makers of printing ink be remedied, then it can been expected that conditions within Italy will be returned to normal, and an extension of exports of materials of this kind to the Balkans can be expected.

The price reduction of newsprint had less of an effect on the rest of the paper market than was speculated, printing paper in rolls and sheets was offered at 77 to 82 lire per kilo, writing paper in rolls and sheets sold at 85 to 90 lire per kilo, and packing paper was marketed at 50 to 53 lire per kilo.

◆

FINANCIAL

Despite the disturbed condition of the securities markets in the last month, paper mill issues did not manifest any definite trend in either direction. Some showed gains, others losses, but the preponderant outlook was for reasonable strength.

Certain-teed Products Corp.—Net income for nine months ended September 30, was $2,759,528, as against $694,364 in the same period of 1945.

Champion Paper & Fibre Co.—Net income for sixteen weeks ended August 16, was $1,491,534 as compared with $527,044 for the comparable period in 1945.

Container Corporation of America—Net earnings for the quarter ended September 30, were $2,110,557 as compared with earnings of $399,828 for the same period in 1945. This constitutes $2.13 per share, against $.51 in 1945. For the six months period concluded on September 30, net profit was $4,803,108 this year as compared with $1,401,962 last year.

Robert Gair Co.—And its subsidiaries report quarterly profit for the period ended September 30, as $600,355 in 1946, or an earning of $.31 on 1,641,924 shares of common stock after preferred dividends paid.

Hummel-Ross Fibre Corp.—Net profit for thirty-six weeks to September 7, was $657,907 as against $293,317 for the comparable period of 1945.

International Paper Co.—John Hinman, president of the company, has announced that International has completed its financial rehabilitation program involving the retirement of 5 per cent preferred stock. The simplified structure now includes 230,579 shares of cumulative $4 preferred and 3,562,139 common shares.

Kimberly-Clark Corp.—Net earnings for nine months ended September 30, were $2,789,338 as against $1,917,979 for the same period in 1945.

Minnesota & Ontario Paper Co.—Net income for nine months ended September 30, was $1,125,490 this year compared with $989,780 for the same period in 1945.

Paraffine Cos.—Net income for the quarter ended September 30, was $634,940 against $370,911 for the same quarter in 1945.

Puget Sound Pulp & Timber Co.—Net profit for nine months ended September 30, was $600,000 as compared with $519,679 for the same period in 1945.

Sorg Paper Co.—Net income for six months ended June 30, was $167,105 against $37,392 for the first half of 1945.

St. Regis Paper Co.—Net income for the first six months of 1946, period ending June 30, was $2,100,299 compared with $1,452,578 for the first half of 1945.

United Paperboard Co.—Net income for twelve weeks ended August 24, was $139,500 against $18,911 for thirteen weeks ended August 31, 1945.

Stock Flotations and Ownership Changes

Crossett Paper Mills, Crossett, Ark.—Statements have been issued by this company denying that its property has been sold or its product obligated to a large converter.

Southern Advance Bag and Paper Co.—A 100 per cent stock dividend has been declared with a cash dividend on the stock equivalent to the former rate.

Madawaska Saw Mill, Van Buren, Me.—The saw mill has been sold to Kenneth C. Irving and American and Canadian associates as part of a plan to convert the property into a $20,000,000 pulp and paper mill. The new interests are those holding the Port Royal Pulp & Paper Company, near St. John and the Dexter Sulphite Pulp & Paper Company, Dexter, New York.

The United States Envelope Company—has sold its Morgan Paper Company Division at Lititz, Pennsylvania, to a new corporation, the Morgan Paper Company which is not affiliated with the older organization.

New York Stock Exchange—Stocks

	Closing Prices Oct. 25	Sept. 25
A.P.W. Products..	5	5⅜
Celotex	25⅞	28
Same Preferred .	20⅝	20⅞
Certain-teed Prod..	17¾	17⅛
Champion P&F Co. (New)	24½	47¼
Same Preferred .	109½	*106–109
Container Corp. ..	41¼	40
Cont. Diamond ..	9¼	9⅞
Crown Zellerbach .	28	29⅛
Same Preferred .	106⅝	105⅛
Same $4 Pref. .	*116–118	*113–118
Dixie Vortex	31⅜	35
Same "A"	53	51
Robert Gair Co. ..	8¼	8
Same Preferred .	19¼	*18–19⅜
Gaylord Container .	15⅜	17
Same Preferred .	*90–100	*90–107
International Paper.	44⅛	42⅜
Same $4 Pref. ..	102	108
Kimberly-Clark ...	24¼	25¼
McAndrews & Forbes	34	*33–35¾
Mead Corp.	21	21¼
Same Preferred .	106	*104–107
Same 2d Pref. ..	46½	45
Masonite	51	57
National Container.	29⅜	28½
Paraffine Cos.	60	63¼
Same Preferred .	107	*108–113
Rayonier Inc.	18½	19⅜
Same Preferred .	35½	35
Scott Paper	46	45½
Same Preferred .	102	*102–103
Sutherland Paper .	42⅜	43½
U. S. Gypsum....	107	106
Same Preferred .	197	*198–202
United Wall Paper.	7½	8½
Same Preferred .	*44–45	*44–50
West Virginia P&P	39¾	42
Same Preferred .	*114–116	*115–117

New York Stock Exchange—Bonds

Abitibi 5%	...	...
Celotex 3½%	103¾	103¾
Certain-teed Prod. 5½%	...	..
Champion P&F Co..	103	104¼
Internat. Pap. 5%..	...	.02¼

New York Curb Exchange—Stocks

Am. Writing	7¾	8¼
Great Northern ..	40¼	39½
Hummel Ross	15½	14
St. Regis	9⅝	10
Taggart	7½	8⅝

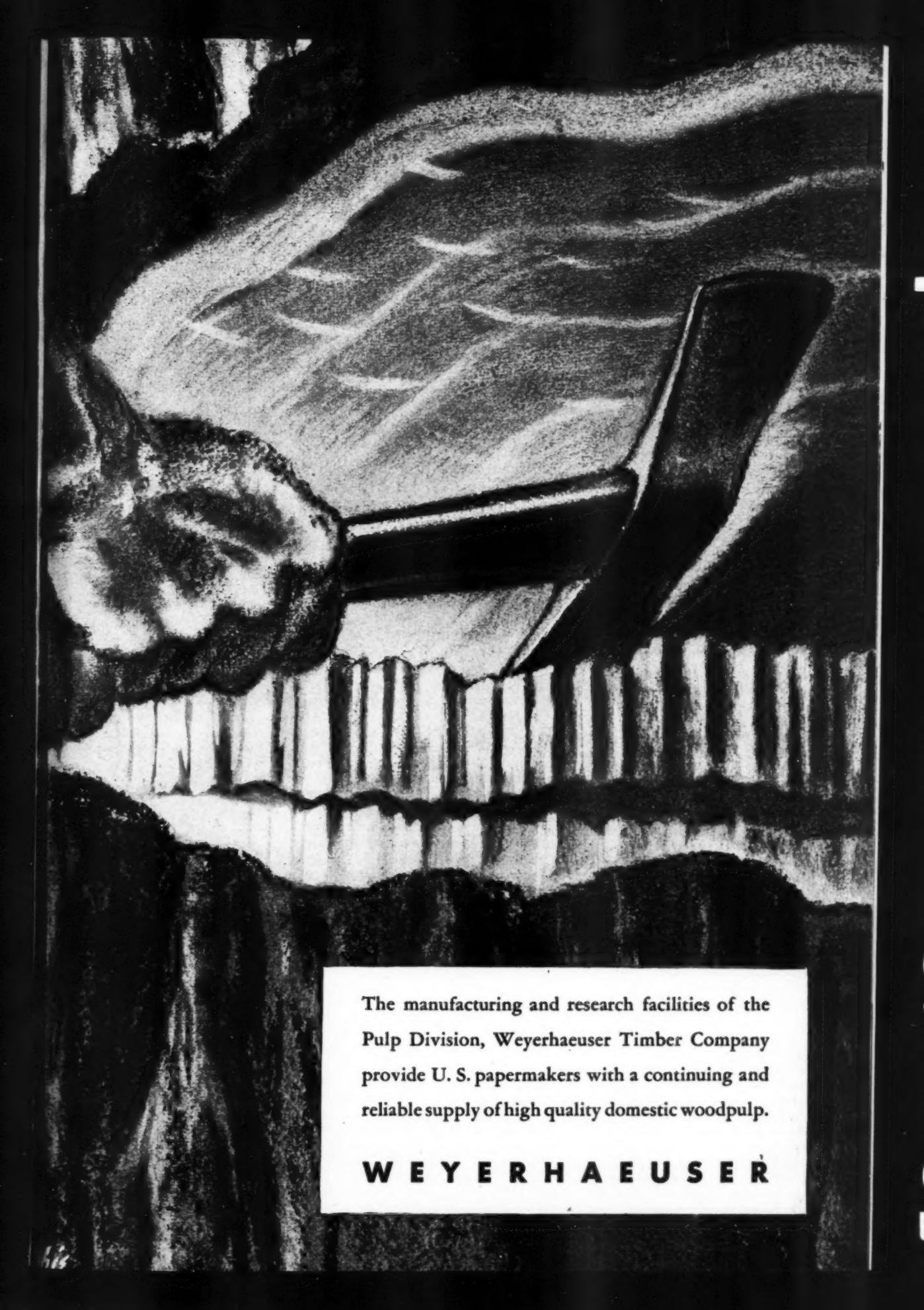
*Closing Bid and Asked Prices.

◆

WISCONSIN FOREST CENTER AIMS FOR SELF-SUPPORT

The new 5,200 acre forest research center in northern Wisconsin is designed to help make the state self-sufficient in forest products. This avowal was made by Joseph Stroeckler, director of the center, at a meeting of government and industry representatives held at Rhinelander, October 23. The meeting was called by E. L. Demmon, director of the Lakes States forestry experimental station at St. Paul, Minnesota, and held in an effort to co-ordinate the activities of governmental and private agencies in the field of forest research.

Because Wisconsin must import 65 per cent of the pulpwood required by



The manufacturing and research facilities of the Pulp Division, Weyerhaeuser Timber Company provide U. S. papermakers with a continuing and reliable supply of high quality domestic woodpulp.

WEYERHAEUSER

its paper mills, and because 60 per cent of the timber consumed by the state is imported higher prices for finished products are demanded. To effectively operate at a lower production cost to manufacturers of forest products, it is necessary to make Wisconsin self-supporting in forest raw materials. Mr. Stoeckler brought this point home to his audience.

Mr. Demmon, outlining the activities of the research center, said that concentration on forest management will be the aim of the center, and the study of forestry economics, surveys, and usages will be left to the investigations of other agencies.

Located in the Nicolet National Forest, north of Hiles, Wisconsin, in Forest County, the research center consists of 4,000 acres of second growth hardwoods and about 1,200 acres of coniferous swampland. Under the program designed to make the state self-supporting in forest products, the center will handle research for 26 Wisconsin counties which contain half the state's acreage, including 10,000,000 acres of forest land. Smaller experimental plots are planned for other sections of the state and will be under direction of the center.

◆

BRITISH PAPER NOTES
(September, 1946)

Following the announcement of extra quotas of newsprint for local and national newspapers it has been disclosed that periodicals and trade journals are also to receive extra supplies of paper. Their present quota is 28½ per cent of prewar consumption and this is to be increased to 40 per cent which is actually an increase of approximately 40 per cent over the quota these papers have been receiving for some time past. The increase is to operate from the twenty-third license period, November next. Since few of these periodicals and trade journals are consumers of newsprint, using mainly higher grade qualities including a fair proportion of coated art paper, and since the coated and higher qualities are in such short supply there is some speculation as to the source of this extra quantity of paper under present low production conditions. It is to be assumed that the announcement would not have been made if the authorities did not think the extra paper would be available.

Part of the answer to this query may be found in the Board of Trade returns for August wherein it is disclosed that the importation of esparto grass has suddenly risen to 80 per cent of prewar. As the yield from esparto grass is much higher than from straw this should provide a stepping up in production by the esparto mills. Imports of other materials during August are little changed in comparison with the previous month excepting rags which have advanced from 914 to 5,077 tons. For the first two-thirds of the present year imports of materials have reached 45 per cent of prewar, and the imports from British Countries have nearly doubled, from 35,174 to 65,619 tons, imports from the Scandinavia countries have been halved, from 983,140 to 476,450 tons. An appreciable increase was recorded for Finland between the two months July and August. Finland has supplied an average of 16,867 tons per month this year against 53,530 tons per month in prewar. Sweden's average so far this year is nearly 85 per cent of 1938.

Imports of paper and boards declined 6,307 tons, comparing August with July, chiefly due to lowered shipments of newsprint almost all accounted for by the very small importation from Newfoundland of 887 tons against 5,027 tons for July. Following the renewal of imports of strawboards from Holland in July an additional 4,068 tons were received in August, but since the average monthly figure before the war was 14,617 tons, Holland has a long way to go to reach this total.

On the export side the general picture is steady but not encouraging. It is noticed that the exports of general printing and writing papers are only 37 per cent of 1938 but on the other hand packings and wrappings are up to 68 per cent of prewar. The most remarkable figures are those for coated papers which are already 50 per cent above 1938. The British papermaker is noted for his coateds and enamels, particularly the esparto based qualities, and with Japan out of the market, with her price-cutting practices, it would seem that these papers are finding ready purchasers.

Although it is recognized that paper is in short supply it would appear that a peculiar position is arising owing to the fact that a bottleneck exists in the printing and binding trades. Publishers who are receiving their regular quotas each license period, which are higher than those of any other section of the trade, are reported to be accumulating stocks owing to the fact that they cannot keep up with their production programs. It is significant that the cry for paper from publishers is no longer heard, but unless anything unforeseen happens there is every possibility that this position may shortly become aggravated. The Court of Inquiry into the printing industry dispute on hours and holidays has now published its report. While they admit that a fortnight's holiday with pay, to operate next year, is practicable they do not admit a reduction of hours from 45 to 40. They do, however, add that some reduction below 45 hours is possible. It is understood that the executive committee of the Printing and Kindred Trades Federation has met to consider the report. Incidentally, when a ballot was taken some time ago there was a large majority in favor of strike action if necessary.

Reports of this dispute in the press together with the publicity attendant on the larger newspapers has focused the attention of the public on the home paper trade and may prove of valuable assistance to the new publicity drive being undertaken by the National Association of Paper Merchants who have already formed a committee for this purpose with regional representatives. The committee is considering a possible broadcast by the BBC, and the formulation of general matter for the press.

Another angle which may help in this direction is the subject of the continuance of the Paper Control. We have often wondered during the past year how long it would be before a voice would be raised in this direction. After the last war, controls were quickly hounded out of existence, but this time the conditions are entirely different. However, the question has been raised in the trade press as to whether the time has come when some of the severities of the Control might be lifted.

But there would seem to be little prospect of any move being made in this direction particularly in view of the pamphlet just written by Sir Walter Leyton (chairman of the Rationing Committee of the Newsprint Supply Company) in which he discloses that present world production of newsprint is down from 8,159,000 short tons, prewar, to 6,803,000 short tons, today. The producing countries will take a long time to bridge this gap, and against this he pointed out the possibility of greater literacy in India, China, and other countries which will further increase the demand. Great Britain's consumption has fallen from 60 lb, per head to 15½ lb, but in the United States it has risen from 56 to 59 lb per head. This world state is confirmed by the remarks of Sir Eric Vansittart Bowater on his recent visit to Newfoundland who stressed the need for an increase in price of newsprint to cover increased wages and considered a decline in consumption up to 20 per cent would not take newsprint from the

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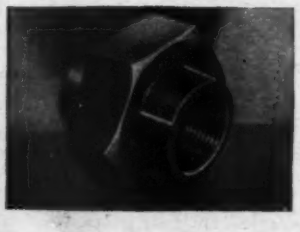

Effective resistance to corrosion means fewer shutdowns, increased production, greater profit.

That is why *ESCO* stainless steel screwed pipe fittings are "must" equipment in pulp mills everywhere. They are made of the same *ESCO* alloy 45 which is now being used so successfully by pulp mills in handling corrosives.

The *ESCO* catalog "Stainless Steel for Ultimate Economy" explains the advantages of stainless steel. It contains a study of corrosion resistance against the common acids, alkalines, gases and salts. This is valuable information, and it is yours for the asking. Use the coupon, or write us.

- Resistant to corrosion and heat
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- Complete stock from ⅛" to 4"

Other types of fittings made to engineering specifications

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Please send study of corrosion resistance to:

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Mechanize your material handling operations and stop worrying about price increases.

You can *insure* your profit position by converting your unskilled labor into skilled labor and achieve mass production at low cost.

CLARK TRUCTRACTOR conducts surveys of material movements and recommends new methods and means to reduce production costs.

A copy of Clark's "Material Handling News" is yours for the asking.

Plan to visit our exhibit, National Material Handling Exposition, Cleveland, January 14 to 17, 1947.

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FORK LIFT TRUCKS TOWING TRACTORS TRANSMISSIONS
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Prices on CLARK products will not be advanced in excess of increased costs.

sellers market into the buyers. He considers that these conditions would remain for at least the next five years.

As an interesting footnote to these items no less than 20,000 people each day are visiting the "Britain Can Make It" exhibition at the Victoria and Albert museum, London, opened by His Majesty the King on September 24th. People are hungry for a sight of the things they may buy one day, although most of the exhibits are, at present, for export only. Many entries have been received from paper and kindred trades.

◆

PAPERMAKING OFFERED IN NEW CURRICULUM AT HOLYOKE EVENING HIGH

An innovation in high school curriculum has been instituted at the Evening High School, Holyoke, Massachusetts, where a course in papermaking was inaugurated October 15, and will continue for fifteen weeks. The studies in the art of papermaking are designed for the residents of Holyoke who are employed in the local paper mills.

Included in the program are visits to the mills and motion pictures of mill operation, as well as study of papermaking chemistry and technology of pulp and paper manufacture. Part of the course will be devoted to methods of testing and evaluating paper and paper products, and an examination of the uses of paper in combination with plastics, waxes, and other materials will be made.

◆

COMMITTEES DISCUSS LAKE STATES FORESTRY NEEDS

Forestry matters pertaining to the welfare of the pulp and paper manufacturers of the Lake States were discussed at a meeting of the Forest Industries Information committees of Wisconsin, Minnesota and Michigan on September 24 at Wausau, Wisconsin. Folke Becker, president of Rhinelander Paper Company, Rhinelander, Wisconsin, and chairman of the committee, presided.

Prominent speakers at the meeting, with highlights of their remarks were:

1) E. W. Tinker, executive secretary of the American Paper and Pulp Association, stated that there are millions of acres of land in the Lake States which could, under systematic management, produce the large volume of timber so urgently needed by the pulp mills.

2) L. A. Furlong, director of public relations, Minnesota and Ontario Paper Company, St. Paul, and chairman of the Minnesota committee, out-

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No single type of dryer felt will meet the needs of all mills. But HOOPERWOOD "Canvas Engineering" has the answer to that problem—a specific HOOPERWOOD Dryer Felt for each requirement.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an Asbestos Felt to withstand advanced temperatures in high speed production of Kraft and other heavy papers—there is a HOOPERWOOD felt to fit your need.

Mill Superintendents find this service invaluable in suiting the particular requirements of their mill—even down to each machine position if desired.

Make your next felt *right*—specify HOOPERWOOD.

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Photo courtesy of the Pusey and Jones Corp.

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COTTON AND ASBESTOS

Armor Coats Metal, Wood and Concrete Against Corrosion, Rust and Age

Eliminate corrosion this quick, easy, low-cost way. NEOLAC is different—*tougher, better, lasts up to twice longer* than most paints. Quick drying Neolac leaves a lustrous, "live" film of pure plastic impervious to corrosive fumes and weather. It is non-oxidizing, won't deteriorate with age, *won't chalk-off*. Neolac brushes or sprays on most every surface, bonds tightly even over previous paintings. Ask your Industrial Distributor, or write direct, for full information.

SAVES MONEY, TOO!

- Gallon covers up to 450 square feet.
- No primer. Two coats ample.
- Longer life.
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lined Minnesota's comprehensive program of education directed toward arousing public appreciation of Forest products.

3) Prof. W. F. Ramsdell, of the University of Michigan, presented a plan to better utilize idle forest lands to meet the needs of the paper industry.

◆

ABITIBI RETURNS TO STURGEON FALLS, ONT.

Ghost town since the Abitibi Power and Paper Company, Limited, closed its mill in 1930, Sturgeon Falls, Ontario, expects a revival soon. Announcement is made that plans are under way to re-open the million-dollar Abitibi mill at Sturgeon Falls. The mill will be engaged in the manufacture of special corrugated paperboard used in lining and packaging. Abitibi has begun renovation of the plant and housing facilities in the area.

As a result of the depression period, the mill was closed and has remained inactive for twenty-six years. The population of Sturgeon Falls with few exceptions left homes and found work in other localities and other industries. Among the people who stuck by the ghost community was Mayor Roy Cockburn and a small group of people who engaged in the fishing industry while awaiting the return of the Abitibi paper mill to production.

◆

CANADIAN NEWSPRINT STOCKS DECREASED

According to the monthly survey of the Newsprint Association of Canada, manufacturers' stocks of newsprint fell off 1,935 tons in September leaving an accumulated 204,576 tons. In September 1945, stock on hand was reported at 117,825 tons.

Although production of newsprint in Canada reached a high in September of 330,063 tons, an increase of 60,100 tons over last year's September production and an increase of 22.3 per cent, shipments of newsprint leaving the country were 5,811 tons in excess of production. The United States received an increased shipment 34 per cent higher than last year, but overseas shipments were down 37.5 per cent compared with September 1945. Total shipments leaving Canada amounted to 335,874 tons, an increase of 58,856 tons or 21.2 per cent greater than shipments for the same month in 1945.

Comparison of capacity production figures for September of this year reveal that newsprint manufactured reached 99.3 per cent of production capacity, this is an increase over the production level of August which

for dependable— FIRE PROTECTION

. . . install an automatic sprinkler system and a Horton elevated steel water tank

A gravity water supply and an automatic sprinkler system provide the kind of fire protection the paper industry can depend upon. The Container Company Division of the Continental Can Company installed this kind of protection when it remodeled the former Reading Iron Company plant at Reading, Pa., for the production of fibre barrels and drums. The large floor area (approximately 188,000 sq. ft.) and the type of materials produced made it undesirable to depend solely upon city mains for the water supply.

The 75,000-gal. Horton elevated tank shown at the left was erected to provide gravity pressure for the sprinkler system. It is a Horton ellipsoidal-bottom tank of welded construction, supported on cylindrical columns made of steel plates. The cylindrical columns and the ellipsoidal roof give the structure a streamlined appearance. They also facilitate painting which results in better maintenance and longer life.

Elevated storage tanks for automatic sprinkler systems usually have a capacity of from 50,000 to 250,000 gals. Horton ellipsoidal-bottom tanks are built in a complete range of standard sizes from 15,000 to 500,00 gals.

When planning the installation of an automatic sprinkler system, write our nearest office for quotations on a Horton tank to provide gravity pressure.

WELDED ELLIPSOIDAL-BOTTOM TANKS

Capacity U. S. Gallons	TANK DIMENSIONS			
	Diam.	Shell Height	Depth in Roof and Bottom	Range
50,000	22'0"	11'0"	4'0"	19'0"
60,000	24'0"	11'0"	4'0"	19'0"
75,000	26'0"	11'0"	5'0"	21'0"
100,000	28'0"	14'0"	5'0"	24'0"
125,000	30'0"	16'0"	5'0"	26'0"
150,000	32'0"	15'0"	6'3"	27'6"
200,000	36'0"	16'0"	6'0"	28'0"
250,000	40'0"	15'0"	7'0"	29'0"
300,000	42'0"	17'0"	7'0"	31'0"
400,000	46'0"	19'0"	8'0"	35'0"
500,000	50'0"	19'0"	9'3"	37'6"

CHICAGO BRIDGE & IRON COMPANY

Chicago, 4.....2445 McCormick Building
New York, 6.....3350-165 Broadway Building
Cleveland, 15.....2267 Guildhall Building
Los Angeles, 14.....1459 Wm. Fox Building
Birmingham, 1.....1511 North 50th Street
Atlanta, 3.....2143 Healey Building
Tulsa, 3.....1651 Hunt Building
Houston, 1.....5643 Clinton Drive
Philadelphia, 3.....1653-1700 Walnut Street Building
Washington, 4.....703 Atlantic Building
San Francisco, 11.....1217-22 Battery Street Building
Detroit, 26.....1566 Lafayette Building

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PENNA.

In Canada: HORTON STEEL WORKS, Limited FORT ERIE, ONT.

reached 99.1 per cent of capacity; and a substantial increase is represented in this year's 99.3 per cent operation against the 80.8 per cent of capacity output in September 1945. However, with shipments of newsprint showing an increase of 5,811 tons, or 101.1 per cent of capacity production, Canadian stocks of this manufacture are depleted.

◆

GAIR OLD-TIMERS ASS'N MEETS AT NEW YORKER

Over 100 members of the Gair Old Timers Association met October 19, at the Hotel New Yorker (New York City) to celebrate its fifteenth annual banquet. The old-timers organization was formed in 1933 in memory of Robert Gair, founder of the Robert Gair Company, Incorporated.

Harry Van Antwerp greeted the gathering, and addresses were made by Charles Stocker and Walter Ringle. The entertainment was directed by Frank McCormick who was assisted by George Rogers and Louis Barbieri.

Highlight of the celebration was the election of officers. Thomas Driscoll was elected honorary president of the association; William F. Cavanagh, president; A. R. Martin, vice president; and J. A. Coakley, secretary-treasurer.

◆

▶▶▶ OPERATIONS OF THE GAYLORD Container Corporation at Milwaukee have been moved to the recently finished section of the third floor of the company's unfinished new plant located at North Teutonia and West Silver Springs Road. The completion of the plant is scheduled for a time soon after the first of the year; when finished the space and production facilities will be about three times the present capacity of the mill.

◆

GREAT BRITAIN NEEDS PAPER NEWSPRINT IMPORTS INCREASE

Britain required 2,000,000 tons of newsprint annually before the war compared with consumption by the United States approximating 5,000,000 tons. Forced by wartime restrictions to reduce newsprint consumption to 250,000 tons a year, Great Britain now proposes to import about 150,000 long tons from Canada and Newfoundland this year, and by 1950 it is hoped that imports will reach 300,000 to 350,000 tons yearly.

The import program is being negotiated by Sir Walter Layton, chairman of the British Newsprint Supply Company's rationing committee, who has been visiting Canada recently to conclude newsprint contracts for the British press.

The existing situation at the cessation of lend-lease which maintained an annual export rate of 200,000 tons to Britain from North America during the war has amounted to a reduction of exports to the rate of 50,000 tons. In face of the reduction of exports from this continent to Britain, the demand in that country for daily papers has risen from 19,000,000 before the war to 25,000,000 at the present time. The size of the British daily paper averages five pages. By following a sliding scale increase in step with the availability of imported newsprint, the size of the daily journals will be increased to six pages in 1947, eight in 1948, ten in 1949, and twelve in 1950, when it is expected imports will reach 300,000 to 350,000 tons annually.

◆

WISCONSIN CONSERVATION DEPARTMENT BUYS PLOT FOR FORESTRY DEMONSTRATION

Purchase of fifty-two acres of woodland located in Vernon County by the Wisconsin Conservation Department for use as a permanent farm forestry demonstration plot has been announced. The unit, first of its kind in the state, will be known as the Champion Valley Timber Harvest Forest. Both the University of Wisconsin and the Vernon County agriculture agency will co-operate in developing the demonstration plot.

Cuttings will be made each year, limited to the amount of new wood grown during that particular year, and the estimated annual yield for the next eight to ten years will be 7,000 to 8,000 feet per year.

◆

▶▶▶ APPROVAL HAS BEEN given by the Civilian Production Administration for construction of a new plant for the International Paper Company at Corinth, New York, according to a recent announcement. The approximate cost of the project is $388,000.

◆

A BOOK THAT WILL ENDURE

The Cathedral Book of Remembrance in which will be printed the 60,000 names of people and organizations contributing to the building of the Cathedral of St. John the Devine in New York, will be made up of Parsons Diploma Parchment, manufactured by the Parsons Paper Company, Holyoke, Massachusetts.

The paper has been processed from 100 per cent highest grade linen and cotton stock; it is of cream white shade, substance 47, and parchment finished.

Immensely valuable, the Cathedral Book of Remembrance is to be bound in sterling silver plated with gold and encrusted with 150 precious stones. The book will be displayed in a permanent place in the Cathedral, but for those desiring to examine the register of contributors, a photostatic copy of the pages will be provided.

◆

▶▶▶ CONSTRUCTION of a three-story office addition at an estimated cost of $35,000 is under way at the Kimberly-Clark plant, Neenah, Wisconsin. The addition is being built south of the main office building and will be of brick and concrete construction.

◆

▶▶▶ PURCHASE OF Tonawanda Corrugated Box Company (North Tonawanda, N. Y.) by the Lawless Brothers Paper Mills, Incorporated, East Rochester, New York, was announced recently. The acquisition of the box company by Lawless brings under its management an organization to which it has supplied liner board for many years.

◆

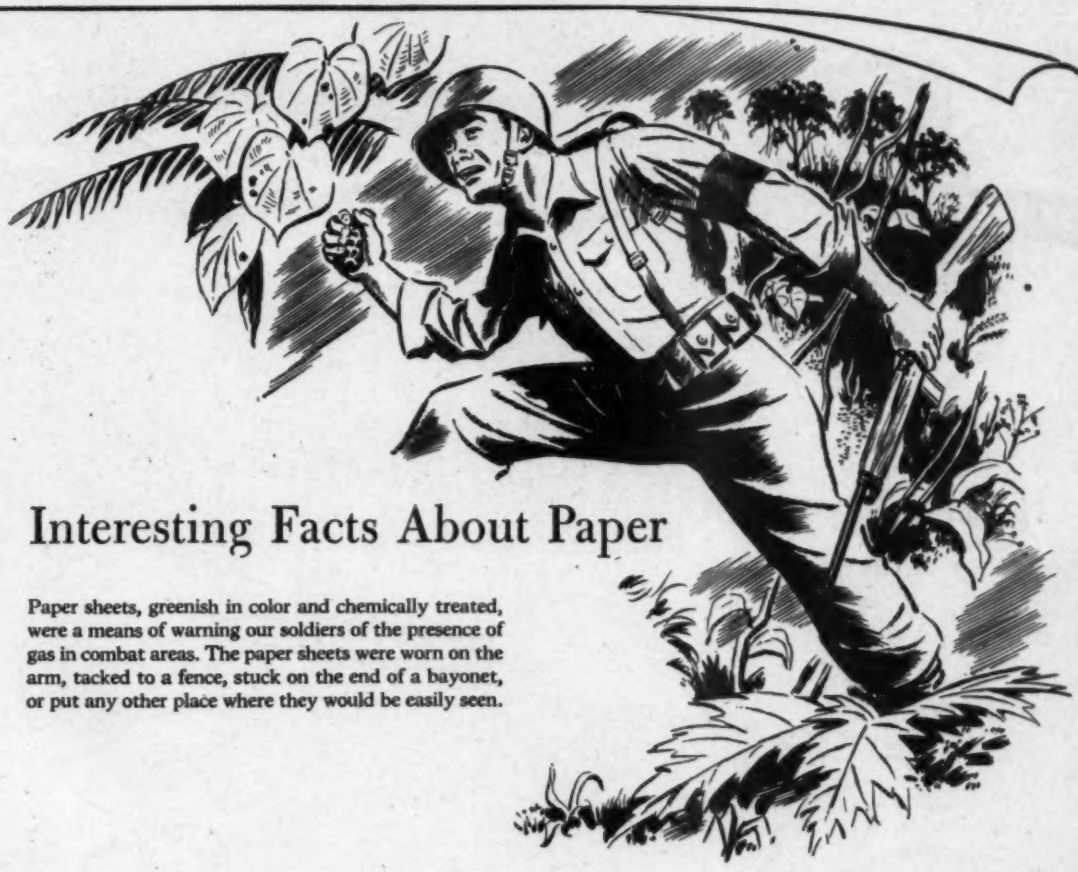
Erratum

In the article "Early Papermaking in New York State," by Harrison Elliott, which appeared on page 663 of the August (1946) issue of THE PAPER INDUSTRY AND PAPER WORLD, there appeared a facsimile of the earliest watermark of the Onderdonk mill.

Since the article was published, the author has found a more distinct copy of the illustration—one that reveals a discrepancy in the outline of the drawing as published with the article. Comparison of the illustration used

here with the one formerly published shows the name of the watermark to be Hamstead—not Hemstead. The author offers this explanation: "Hamstead seems to be an early spelling for what is now Hempstead. Hamstead H signifies Hamstead Harbor on which Roslyn is located."

The author also suggests that the spelling of Onderdonk was written "Underdunk" by George Washington in his diary.



Interesting Facts About Paper

Paper sheets, greenish in color and chemically treated, were a means of warning our soldiers of the presence of gas in combat areas. The paper sheets were worn on the arm, tacked to a fence, stuck on the end of a bayonet, or put any other place where they would be easily seen.

Interesting Facts About Helmerco Blues

Helmerco Blues comprise an interesting group of tinting pigments known to papermakers everywhere for the blue-white perfection they bring to white bond, writing, book, ledger and other papers at minimum color cost.

Helmerco Blues are excellent performers in any furnish and are dependably uniform. Added directly to the beater, Helmerco Blues disperse rapidly, giving a broad range of quality white shades with good light fastness and excellent brightness. Fine light blues in the same group of papers can also be produced with Helmerco Blues, as well as fast-to-light specialty shades.

Consult your Heller & Merz representative for complete information on Helmerco Blues.

Heller & Merz Department

CALCO CHEMICAL DIVISION · AMERICAN CYANAMID COMPANY

BOUND BROOK, NEW JERSEY

New York · Chicago · Philadelphia · Boston · Charlotte · Providence

Calco

ONE *recognized standard*

THE COTTRELL PROCESS OF ELECTRICAL PRECIPITATION

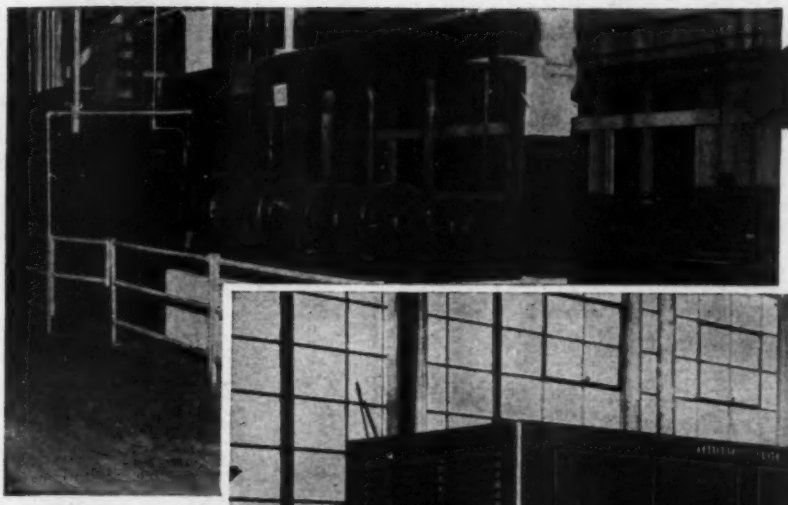
FOR GAS CLEANING, smoke abatement and removal of dust, fume, tar and other suspended matter from gas, there has been one universally accepted process for more than thirty years. In answer to your special problem, a Cottrell installation incorporating this rich experience in research, development and worldwide operation means the complete fulfillment of your requirements.

RESEARCH CORPORATION

NEW YORK 17: 405 LEXINGTON AVENUE
CHICAGO 3: 122 SO. MICHIGAN AVENUE

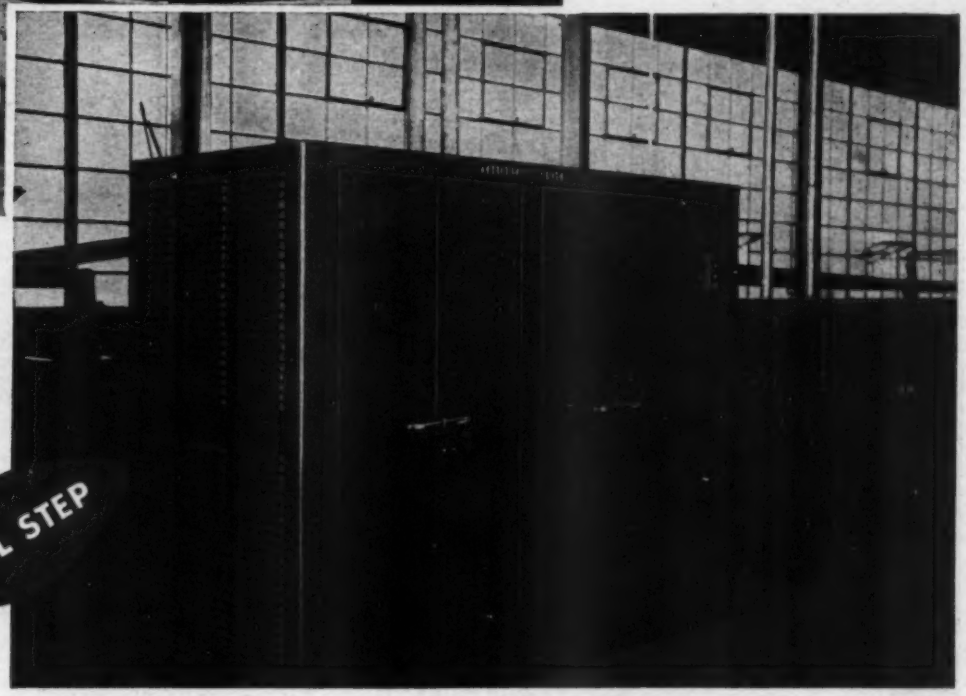
SPOT CONVERSION of A-c. to D-c. Power

for Efficient Paper Mill Processing



FIRST STEP

Typical Motor-generator Sets, which are exposed to accumulations of dust, dirt and harmful abrasives.



RELIANCE V★S DRIVE

THE FINAL STEP

Reliance V★S Drive (for on-the-spot conversion of A-c. to D-c. power) are compact, conveniently-packaged, factory-wired units. Filtered, ventilated, always clean—they offer you all the advantages of a separate motor room.

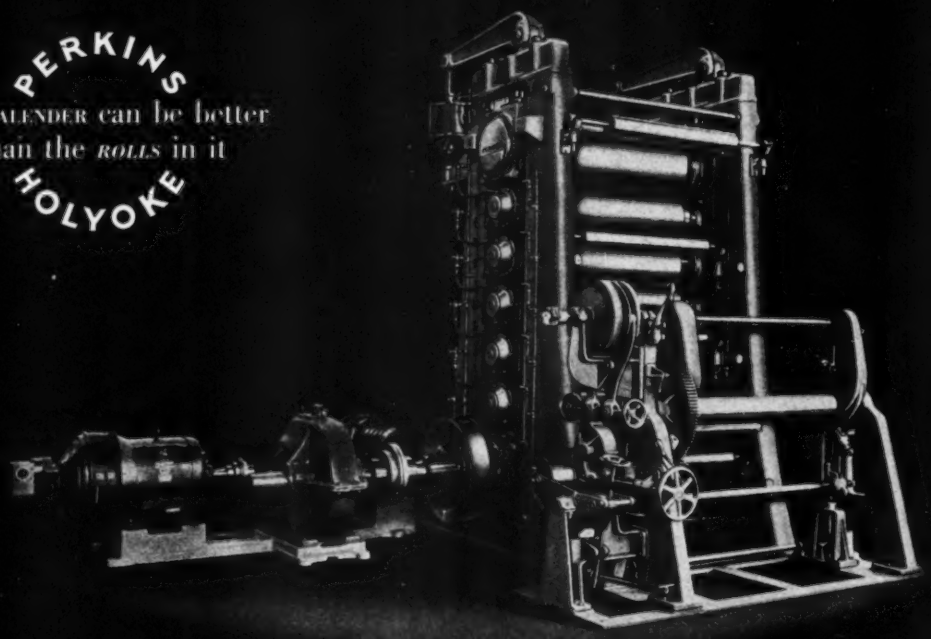
★ ★ ★

V★S, the *All-electric, Adjustable-speed Drive for A-c. Circuits,* is available in sizes up to 200 horsepower. The great flexibility this drive brings to any operation includes an infinite range of stepless speed changes—instantaneous stops and starts and many other specialized functions. Control can be automatic or manual—either at the machine or from remote stations. You will find more important information on how V★S increases production and cuts costs in Bulletin 311. Write for it today!

RELIANCE ELECTRIC & ENGINEERING COMPANY
1078 IVANHOE ROAD • CLEVELAND 10, OHIO
Sales Representatives in Principal Cities

RELIANCE (AC DC) MOTORS

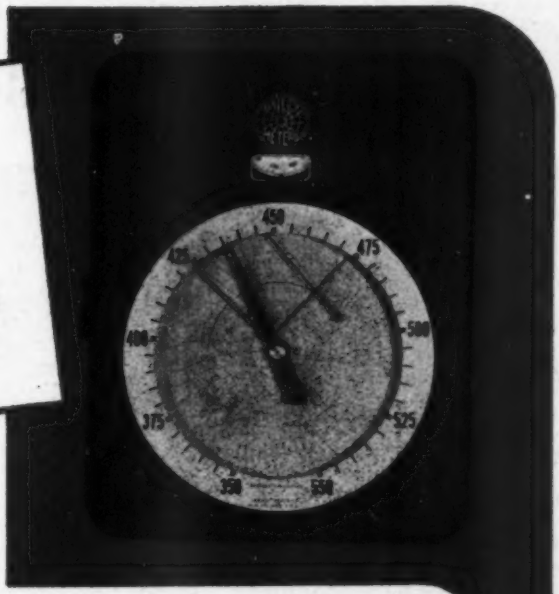
PERKINS
No CALENDER can be better
than the *ROLLS* in it
HOLYOKE



PERKINS

B. F. PERKINS & SON, Inc.
HOLYOKE, MASS., U.S.A.
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

3 WAYS to CONTROL TEMPERATURE



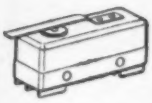
WITH BAILEY PYROTRON ELECTRONIC RESISTANCE THERMOMETERS

1. FOR AIR-OPERATED SYSTEMS

A free floating air pilot valve actuated by the Pyrotron slidewire unit establishes an air loading pressure for the control of valves and drives. Adjustments and relays provide flexibility of range, sensitivity, and speed of response, as well as reset action, easy coordination with other factors, and remote manual control.

2. FOR ON-OFF ELECTRICAL SYSTEMS

By Electronic Relay—Two slidewires, one set manually to the desired temperature standard by a convenient knob and scale, and the other automatically positioned by the Pyrotron slidewire unit, form a control bridge which operates an electronic relay.



By Electric Contacts—Adjustable cam on Pyrotron slidewire unit operates a totally enclosed snap switch.

3. FOR MODULATED ELECTRONIC SYSTEMS

A control bridge formed by two slidewires establishes a small signal voltage which changes in phase and intensity to operate a standard electronic control unit. The d-c output of this unit is accurately regulated according to the signal and applied to a saturable core reactor to vary voltage on the a-c heating circuit.

UNUSUAL FEATURES OF THE BAILEY PYROTRON ELECTRONIC RESISTANCE THERMOMETER

1. Resists vibration and shock.
2. Needs no careful leveling.
3. Motor drive provides abundant power for operation of recording pen, controller, alarms and signals.
4. Simple a-c measuring bridge needs no battery.
5. Sturdy electronic units keep the bridge in continuous balance and replace the usual galvanometer and its attendant mechanism for step by step balancing.
6. Interchangeability of packaged units simplifies replacement.

For details on this unusual Electronic Resistance Thermometer, which indicates, records and controls temperatures between −100°F. and 1200°F. ask for Bulletin 230-A. P-10

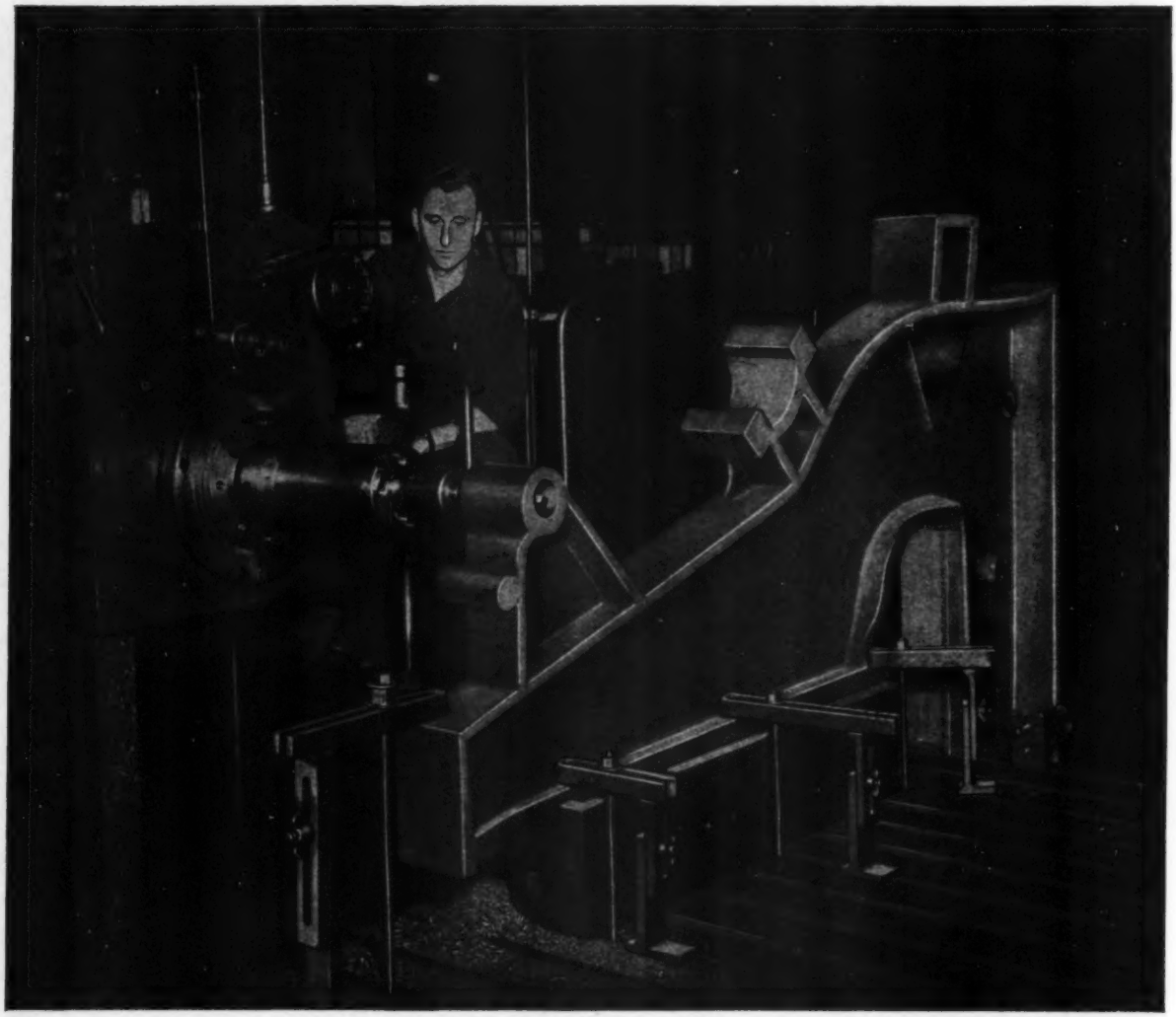
BAILEY METER COMPANY

1050 IVANHOE ROAD • • • CLEVELAND 10, OHIO

Controls for Processing

TEMPERATURE FLOW
PRESSURE LEVEL
% OXYGEN DENSITY
% COMBUSTIBLES, RATIO

What MAKES IT DIFFERENT?



The high skill of workmanship which goes into Bagley & Sewall paper machinery is reflected in the excellent quality and high production records attained on Bagley equipment.

We invite you to consult us on your paper mill problems whether they are simple or complicated.

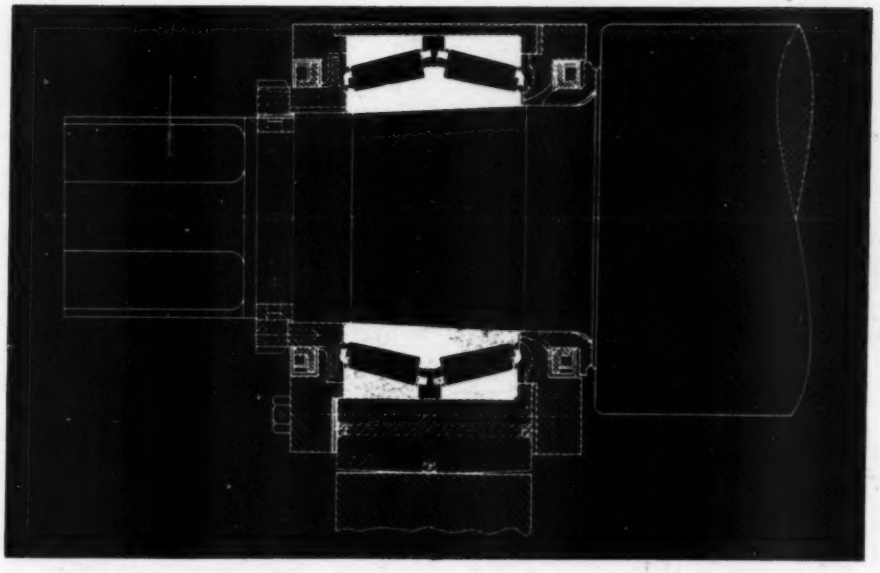
Our sales and engineering staffs will be glad to cooperate with you in solving your production problems whether they cover a complete machine or the reconditioning of your existing equipment.

BAGLEY & SEWALL

WATERTOWN, NEW YORK

Give your Calenders

TIMKEN *balanced proportion* Bearing Benefits



Put the new Timken DIT Type Balanced Proportion Bearings on the top and bottom rolls of your machine and super calenders and watch their performance improve!

These bearings assure increased roll rigidity with minimum roll deflection under all load conditions because they make possible greater roll neck diameter and strength, plus maximum radial, thrust and combined load capacity.

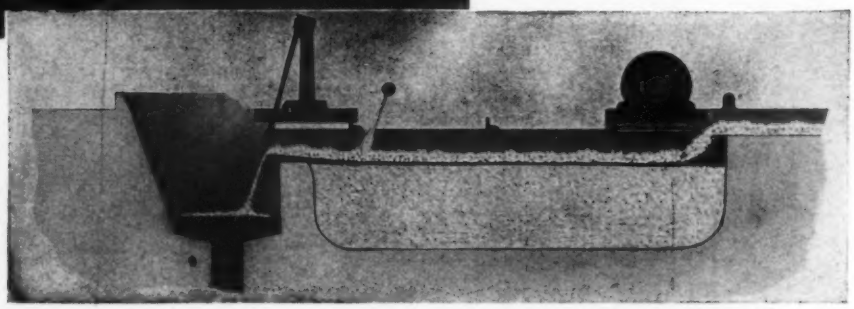
The simplicity of the new bearing mounting, as shown in the drawing, makes assembly and removal of the bearings from the roll necks much easier.

The trade-mark "TIMKEN" stamped on the cup and cone of every bearing identifies it as the product of The Timken Roller Bearing Company. Make sure this trade-mark appears on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio.

Sandy Hill SHAKER SCREEN

Saves POWER

Saves SPACE



EFFICIENCY IN SIMPLE DESIGN

Diagrammatic sketch showing the simplicity of design.

Sandy Hill offers to the pulp and paper industry an exceptionally effective "Shaker" screen. Many of these screens were first used as bull screens, knotters or sliver screens and have proved to be of high capacity for small space demand. Now, they are offered as paper machine screens and pulp mill screens with slotted plates.

The effective action of the screen is due primarily to the shallow stock depth in the screen basket. When the basket is in its highest position, the bottom is merely immersed in the stock and acts as a slide on which, under the influence of the oscillating motion and inflowing stock current, the rejections are gradually discharged, while the accepted stock passes down through the perforations. Due to the low stock depth, the flow is very gentle and the rejections are not whirled around and stuck in the screen plate slots. Oversize particles are thoroughly washed so that all the good fibres are retained and nothing but undesirable material is discharged.

Write for folder!

The screening basket is welded structural steel with a perforated screen plate bottom. At the stock inlet side the basket is suspended from two eccentrics and at the opposite end from two swing levers. Eccentrics and drive shaft are supported in roller bearings. Through shower pipe the rejections are thoroughly washed out before being expelled. This pipe is of ample size to permit the use of white water and to permit cleaning during operation.

In connection with knotting, the shaker sliver screen overcomes the weak points of the rotary screen. Its space requirements per ton of capacity are small. The screening action removes all undesirable particles, while retaining the good fibres.

THE SANDY HILL IRON & BRASS WORKS
HUDSON FALLS, N. Y.

NEW Monsanto Plasticizers

SANTICIZER 130
SANTICIZER 131

CLEAR and practically colorless

Both of these new Monsanto plasticizers — Santicizer 130* and Santicizer 131* — are clear and practically colorless liquids, have an exceptionally wide range of compatibility and are comparatively stable under heat.

Santicizer 130 and Santicizer 131 are suggested for use as plasticizers in cellulose acetate molding compositions; plasticizers in lacquer type coatings; plasticizers in paper coatings, to impart gloss and improved transparency. They are especially useful to modify shellac, zein and similar type products. In general, they impart toughness, high gloss and good flow.

(Both of these plasticizers are available in pilot-plant quantities only.)

For complete details, including compatibility data, ask for Technical Bulletins O-D-100 and O-D-101. Contact the nearest Monsanto Office, or write direct to: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

*Reg. U. S. Pat. Off.

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

CHEMICAL AND PHYSICAL PROPERTIES:		
	SANTICIZER 130	SANTICIZER 131
REFRACTIVE INDEX AT 25°C.	1.5300—1.5310	1.5295—1.5315
SPECIFIC GRAVITY 25/25°C.	1.1760—1.1770	1.1680—1.1725
COLOR	APHA 40 Maximum	APHA 40 Maximum
ODOR	Very slightly fruity	Very slightly fruity
ACID (as H_2SO_4)	.005—.01	.005—.015
CRYSTALLIZING POINT	Becomes a glass-like solid at —30°C.	Becomes a glass-like solid at —30°C.

UNION PACIFIC RAILROAD SERVES SUN VALLEY

Re-opens December 21st

Sun Valley · Idaho

Its war duty as a Navy rehabilitation center ended, America's famous year 'round sports resort invites you to enjoy a winter vacation in Idaho's Sawtooth Mountains.

For experienced and intermediate skiers—a variety of fast open and partially timbered ski-runs. For beginners especially—but available to all—instructions by a selected staff of experts headed by Friedl Pfeifer. Special skiing events have been scheduled for winter season.

Electrically operated chair-lifts make it possible to enjoy a maximum of ski-runs.

Other activities include skating, sleighing, and swimming in warm-water outdoor pools. And in evening hours—music and dancing.

Accommodations at a wide price range. For protection of guests, reservations must be confirmed in advance. Write or wire—

W. P. ROGERS, Gen'l Mgr., Sun Valley, Idaho

WINTER SPORTS UNDER A "SUMMER SUN"

"A NORTHERN Would Slash Handling Costs"

1. labor saving

When men lift and move material by hand, the power generated costs you at least $5 per kilowatt hour. Power for a Hi-Lift Electric Hoist costs you less than a nickel per kilowatt hour. Manpower lifting is slow, time wasting, costly. Hi-Lift Hoists do it quickly, economically.

2. time and overhead saving

Inefficient, slow material handling causes delay and countless minutes of lost time all through the shop while other operations wait on handling. Hi-Lift Hoist saves this time and money.

3. saving through safety

Men handling heavy material by hand are subject to serious and costly injuries. Power handling avoids these.

4. saving in floor space and overhead

Northern Hi-Lift Hoists use *no* floor space—carry the material above the floor. There is no vehicle wear on the floor—no danger to workers from rapidly moving vehicles. Aisles are used for work and walk space only—a substantial saving in space. The low-head-room feature of Hi-Lift Hoists makes better use of overhead space—permits handling of bulkier loads.

NORTHERN HI-LIFT HOIST

Northern Hi-Lift Electric Hoists are extremely sturdy, long lasting. Write for Bulletin H-7.

1542

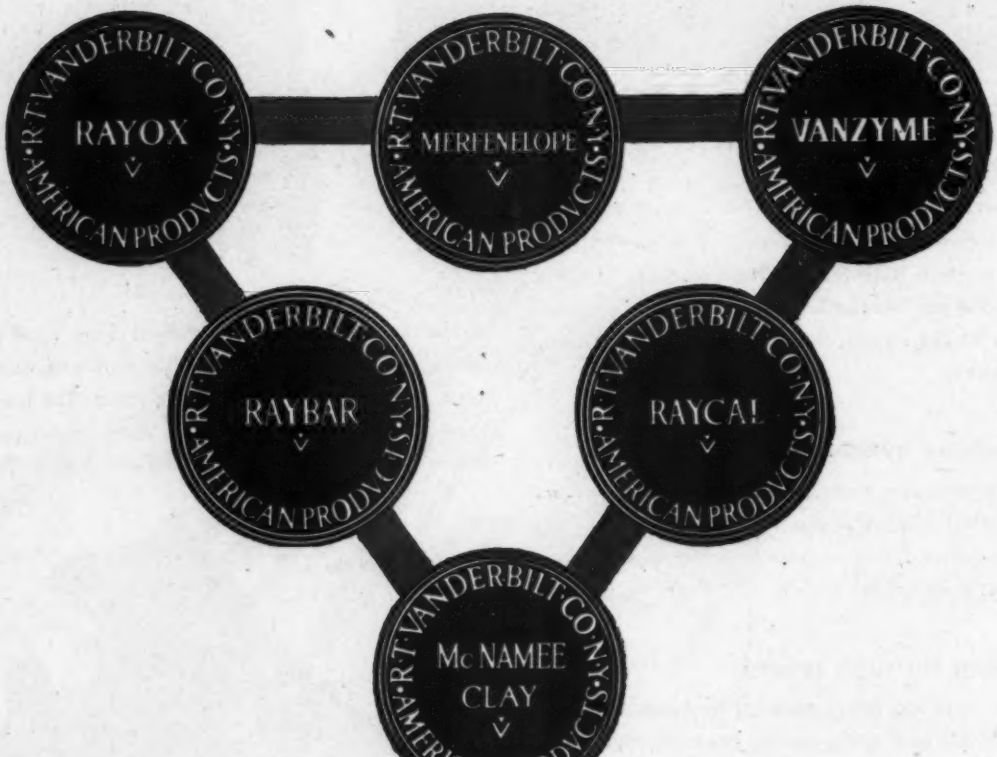
NORTHERN ENGINEERING WORKS
General Offices: 2625 ATWATER ST.
DETROIT 7, MICH.

TYPES OF NORTHERN HI-LIFT HOISTS AVAILABLE

Floor controlled hoists • *Motor traveled hoists*
Cab controlled hoists • *Base mounted hoists*

VANDERBILT

American Products



Each the Best In Its Class

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City

The Paper Shortage

▶▶▶ THE DEMAND FOR PAPER products is insatiable—that statement is supported by the fact that every paper mill in the United States is running to full capacity and every ton of production is going into consumption—still consumers cry for more. We say every paper mill is running to full capacity—by that we mean every mill that can get fibrous raw material.

There *is* a drastic shortage of paper, and there will be a drastic shortage of paper products for a long time to come. These facts are obvious to anyone who impartially investigates the pulp and paper situation and the demand and supply relationship in this country.

The demand for paper products in 1941 absorbed all of that peak year's supply. Then followed the war years of 1942-43-44 and 45, during which time the actual direct and indirect requirements for war purposes imposed a 72 per cent increase in orders on top of the civilian demand. Also during that period the civilian demand cleaned up all paper inventories and reserve stocks of every description, in every position. Never have the mills, distributors, converters, and large stock-carrying manufacturers seen their warehouses and stock rooms so bare of paper products.

It was generally anticipated that after V-J Day there would be an easement in the tight paper situation. But such was not the case. By the time the war contracts were closed, the demand was as great as it was at the peak of the war. This was due to the fact that a large portion of the new uses created by the war carried over into the postwar era as an addition to the pent-up civilian demand. The result was that six months after V-J Day paper products were in scarcer supply than at the height of the war demand.

This situation presented a baffling problem to many consumers. The reason for it lay in a fact which few people have taken into consideration; viz., that ever since 1941, our population has been increasing at a rate twice as great as that in the Roosevelt decade of 1930 to 1940. Also, that the end uses for paper and pulp products have multiplied at an accelerated rate.

These two factors, the increase in population, and the multiplication of end uses, are the sources of the demand and augmented demand. They have been increasing continually every day, constantly, urgently pushing the demand for paper products higher and higher.

In the meantime the accompanying tabulation shows a yearly decrease in the production of paper and paper products as compared with 1941 peak production.

The significant fact which these figures portray is that during all of the time we enjoyed the highest demand for paper products, the production declined every year under 1941 tonnage, to the cumulative amount of 2,372,898 tons, and the tonnage available for consumption showed 3,105,776 tons lost.

Another significant fact is that in spite of this cumulative loss, the performance by the industry was a magnificent support of the war effort, in that it maintained a record of highest production for those four years, when it was bitterly needed.

Year	Tons Production	Tons Under 1941	Tons Consumption	Tons Under 1941
1941	17,762,365		20,418,188	
1942	17,083,862	678,503	19,780,441	637,747
1941	17,762,365		20,418,188	
1943	17,035,688	726,677	19,478,195	939,993
1941	17,762,365		20,418,188	
1944	17,182,804	579,561	19,485,887	932,301
1941	17,762,365		20,418,188	
1945	17,374,208	388,157	19,822,453	595,735
Accumulated Decrease		2,372,898		3,105,776

Another point which needs emphasis now is that the production of those high tonnages constituted a terrific drain upon our timber resources, for not only did the paper industry, but the lumber industry as well, place an abnormally heavy pull upon our forests, which have suffered a 50 per cent over-cutting, above their annual growth, since Pearl Harbor.

The result is now becoming apparent—The United States does not produce more than 50 per cent of the wood pulp fiber needed to sustain its present production.

In the first 6 months of this current year, Canada provided 31 per cent, Sweden sent us 17 per cent, and Finland 3 per cent showing that 51 per cent of our production was from import fibers.

We quote from a recent government report on the present situation, "In spite of the high production level the supply-demand situation shows *no* improvement. Mills continue to allocate their output among old customers and refuse in most cases to take on new accounts. Moreover, the mills show an increasing tendency to supply nearby markets at the expense of those located at greater distance. In New England, distributors state that the supply situation is currently worse than at any time during the war."

Granted the first eight months show an increase in the production of products, all of it has gone into immediate consumption, while distributors' warehouses are bare; converters are closing their mills for lack of supplies; and consumers are complaining bitterly because of the exhaustion of their needed paper.

We need more pulp mills.

We need more fiber.

We cannot maintain our present production on our present domestic installations.

The housing situation is demanding more and more lumber; the paper industry is faced with an overwhelming demand for more and more paper. Where are we to obtain the timber?

In 1940, we had 131,700,000 population.

In 1946, the census bureau estimated we have 141,500,000 people, a growth of 9.8 millions of additional paper and wood consumers in 6 years.

In the Roosevelt decade, 1930 to 1940, the growth in population was 8,994,000. The growth in population of 9.8 millions since then calls for 1,500,000 additional tons. The multiplication of end uses demands at least 6,000,000 more tons.

CURRENT THOUGHT

In Dwellings—The Old Order Changeth

WILLIAM SIBLEY

▸▸▸ THE BUILDING industry, in so far as single dwellings are concerned, stands on the threshold of revolutionary advancement. Finally, at long last, we have learned how to manufacture homes on a mass production basis. The building industry, today, is in the same position as the automotive industry was in 1920. Back in those days, and prior thereto, the automobile was largely a luxury. And none too efficient. Except in the southern states, car owners usually put their automobiles up on blocks, come half-past Thanksgiving, and didn't take them down until about March fifteenth. Automobiles were chiefly a Sunday whirl-a-gig—a toy.

But along came World War I and through it we were taught that automotive power (cars and trucks) were a military necessity. We discovered that our cars and trucks could be made to negotiate the mud and snow and torn terrain of battlefields. From that lesson we learned that automobiles and trucks had become indispensable to our economic welfare. So—beginning with about 1919 or 1920, we made our cars on a mass production basis; made them better; paved hundreds of thousands of miles of streets and highways. All to the result of building a tremendous industry, vitally essential to health, happiness and prosperity.

What World War I did to the automotive industry—World War II has done for the home building industry. Through our experiences in mass production of dwellings (all the way from cracker-box 20x20 houses and quonset huts to huge multiple apartment projects) throughout the war years, we now know how to build homes in factories and assemble them on the sites.

Ever since man emerged from caves, he has been building dwellings out of available materials: trees, mud and skins. But these things (lumber, plaster, poured concrete, paper or paint) do not lend themselves to mass production methods. The only thing that can be done with them is to cut the individual members to fit, then put those members together with hammer and nails—by virtue of hand labor. So, if we are to have prebuilt homes (and we are already making them) we must accustom ourselves to the use of new materials. We must use something besides trees and mud.

Only metal lends itself to mass production methods, true economy of construction, and speed of erection. And of all metals, steel is by far the best suited. So the homes of tomorrow will be of steel, finished with porcelain enamel (non-gloss) and made in such a manner and with such a variety of colors that there will be an infinite variety of arrangements of rooms on the interior, and with no rubber-stamp appearance of duplication on the exterior.

One such house is now being produced by a Chicago corporation. Here is a very attractive bungalow, made entirely of porcelain-enameled steel, 32 x 36 feet in size, with 8-foot ceilings. Instead of heavy dimension timbers for sills, and 2 x 4's for studding and rafters, the material will be special steel structural members. Instead of shiplap or drop-siding for exterior finish, and shingles for the roof, new homes will have steel sections in various sizes up to 8 x 8 feet. Instead of lath, plaster and paper for the interior, the walls will be non-glossy porcelain enameled steel panels. The floor will be a slab of concrete.

This new home will be thoroughly insulated, and equipped with hot-air radiant heating from the ceiling and walls. The heating element will be equipped for either oil or gas. The kitchen will contain an electric refrigerator and range with an abundance of cupboard, closet, and cabinet space. The living room will be equipped with bookcases, while in the master's bedroom, one wall will have a large dressing table and mirror. The bathroom will be all-porcelain, available in a variety of pastel colors. The walls, both side walls and room partitions will be fully wired, with an ample number of outlets.

Being prebuilt at the factory, this home can be delivered to the homesite and erected on the foundation by a crew of five men in three eight-hour shifts. At the end of the 24-hour working period, the home will have been fully plumbed, wired for light, and made entirely ready for occupancy, clear to the keys. And please get the difference between being "prebuilt" and "prefabricated." The "made" home is no more "prefabricated" than the automobile you buy. . . . If you bought a prefabricated automobile you would get one delivered in a truck, from which the men would unload an engine, a differential, a transmission, four fenders, five wheels, a top, a radio, a steering wheel, etc., etc. It would then be put up to you to put the elements together to have a car. . . . That is exactly what you get when you buy a "prefabricated" house, whether it be one of the modern homes or back to the old houses of thirty and forty years ago. They are merely cut to fit—and you have to have the elements put together. In the prebuilt home or the metal houses of tomorrow, you will be buying a truly "prebuilt" home which requires the minimum of hand labor for erection. Being made entirely of steel it is, of course, fireproof—and somewhat hard on the termites. Being porcelain enameled it is paint free. You can wash down the exterior, when needed with a garden hose, and clean the interior walls and ceilings with a damp cloth or mop. It is a home which, if built out of standard materials, could not be obtained for more than twice its cost—which is about $7,500.

The Chicago corporation plans to make its all-steel homes at the rate of 400 per day. That means, working two shifts per day, a house every 2.4 minutes. Indeed, making such homes in Chicago, the home owners in Baltimore can go from raw steel stock and 100-pound bags of frit (raw porcelain enamel) to coffee and doughnuts in their own kitchen in 33 hours and three minutes. Here is the way to do it: Fabricating the house: 3 minutes. Loading it into a freight plane: 1 hour; flying time to Baltimore: 3 hours; trucking from airport to home site in Baltimore: 1 hour; erection time: 24 hours; moving furniture and rugs into the new home: 3½ hours; time for making doughnuts and coffee: ½ hour. Total elapsed time: 33 hours and 3 minutes.

Sounds incredible—yet such homes and such possibilities are here and now. . . . Yes, the Hohenzollerns and the Hitlers taught us many things.

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Chain quality starts in design . . . and design "know-how" rests upon experience. Link-Belt has pioneered the use of Conveyor and Drive Chain in American industry for over 70 years. This provides a broad base of operating experience under every conceivable condition. You are assured that "Chain . . . by Link-Belt" can be trusted, fully, to do the job.

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Ewart Detachable Link-Belt. A widely used chain for average service on drives, elevators and conveyors.

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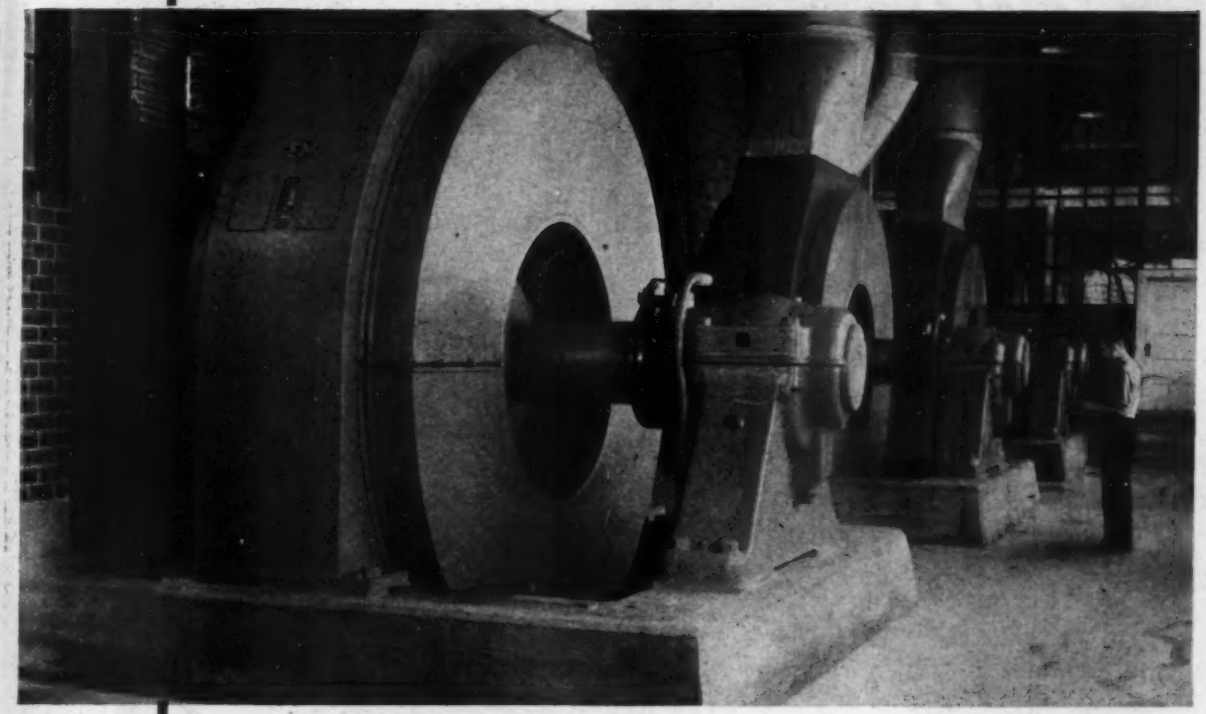
You Want REAL DEPENDABILITY for BIG Drives Like These!



To drive big pulpwood grinders that tear the fibers from nearly 200 tons of southern pine logs daily, takes motors with plenty of "guts".

These synchronous motors have it!

They've got it *because they were designed and built that way.* These three 4000 horsepower E-M synchronous motors, and a fourth bought later, deliver the punch necessary to do the job right. Each motor drives in tandem two huge grinders of the Great Northern type at a southwestern newsprint mill.

It takes a *special* kind of engineering . . . backed by thousands of synchronous motor horsepower correctly applied in paper and pulp mills . . . to build big motors like these.

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Today, with larger pulpwood quotas and higher mill costs, dependable drives are a "must". You get *real dependability* when you specify E-M Synchronous Motors. *Call in the E-M engineer on your next drive problem.*

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Specialists in Synchronous Machinery Since 1903

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Powell's contribution to national prosperity is a line of valves that is so complete that today there are Powell Valves adapted to *every* service in *every* branch of modern industry.

The Powell Line includes Bronze and Iron Valves of all required types, designs and sizes; Cast Steel Valves of all types in pressure classes from 150 to 2500 pounds; and a complete line of valves for Corrosion Resistance, including many special designs and made in the widest range of Pure Metals and Special Alloys ever used in making valves.

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Catalogs furnished on request. Kindly state whether you are chiefly interested in Bronze, Iron, Cast Steel or Corrosion-Resistant Valves.

Fig. 1816—All Iron Gate Valve for 125 pounds W. S. P. Made in sizes 2" to 30", inclusive. Has flanged ends, bolted flanged yoke, outside screw rising stem and taper wedge solid disc.

Fig. 1259—All Iron Swing Check Valve for 125 pounds W. S. P. Made in sizes 2" to 12", incl. Has flanged ends, bolted flanged cap and regrindable, renewable iron disc. Disc, when wide open permits full, unobstructed flow through the valve body.

Fig. 457—All Iron Globe Valve. Has flanged ends, bolted flanged yoke, outside screw rising stem and regrindable, renewable iron seat and disc. Made in sizes 2" to 12", inclusive.

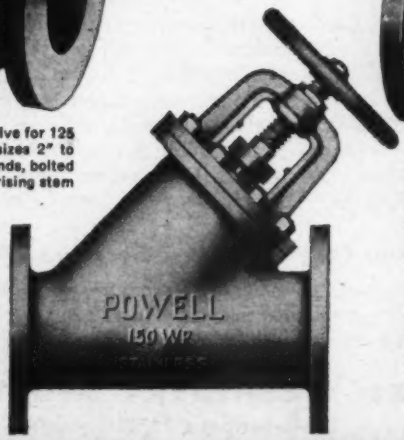


Fig. 1944—Large size 150-pound Stainless Steel "Y" Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem. Made in sizes 2½" to 12", inclusive.

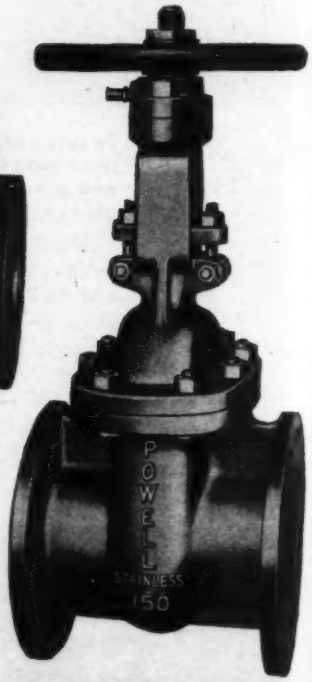
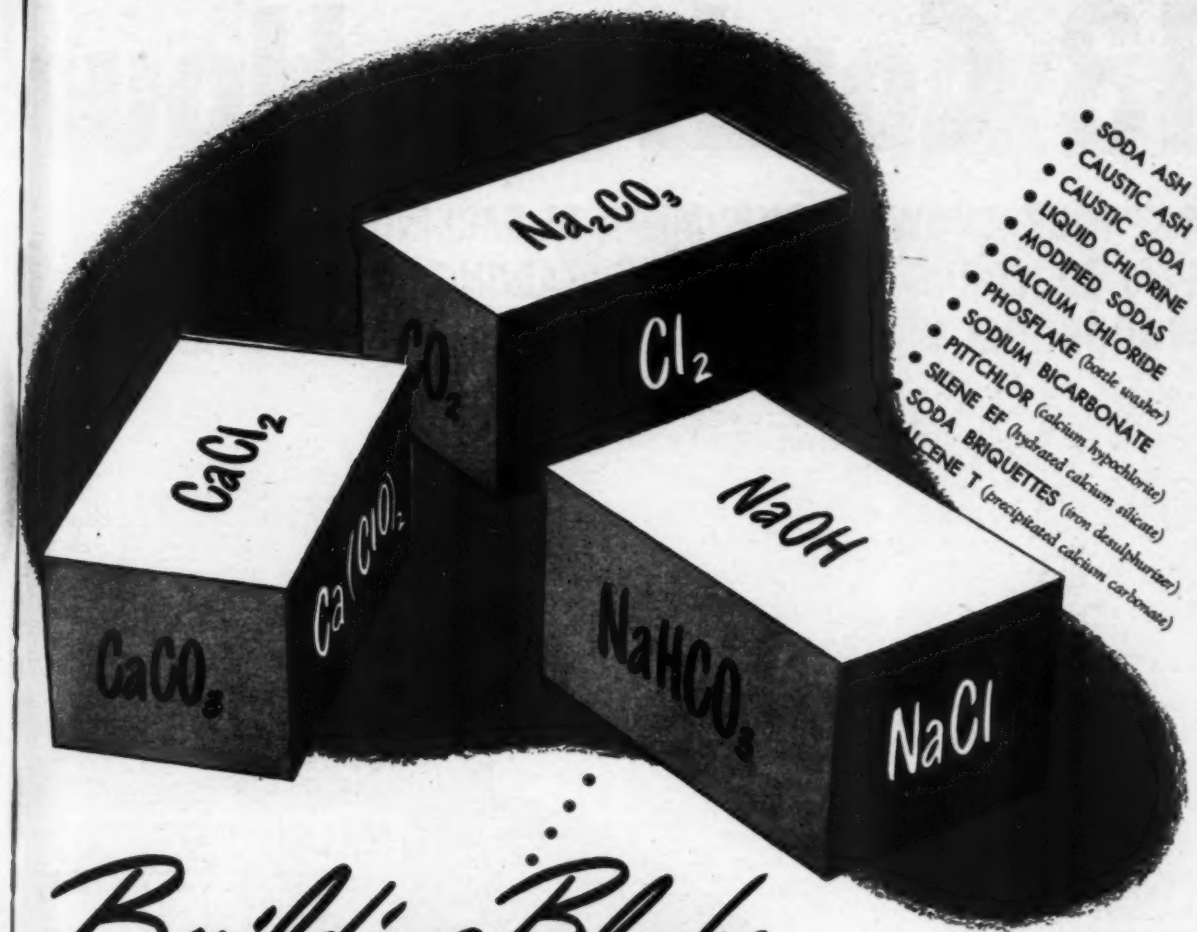


Fig. 2453-G—New Standard 150-pound Stainless Steel Gate Valve with flanged ends, bolted flanged yoke-bonnet, outside screw rising stem and taper wedge solid disc. Made in sizes 2½" to 8", incl.

POWELL VALVES



Building Blocks of Industry

These essential chemicals are aptly called "The Building Blocks of Industry," because without them products of modern Industry would not be the same as we know them today—and many could not be made at all.

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13 Cords an Hour

A-C TOUR SHOWS OTHER MILLS DE-BARKING 6 to 10 CORDS PER HOUR . . . GAINING IN WOODROOM OPERATION AND PULP QUALITY

AT 30° BELOW ZERO OUTSIDE TEMPERATURE, in this leading Eastern Mill, Streambarker averaged 10 cords per hour on frozen Spruce! As temperature rose to 20° above, capacity jumped to 15 cords!

Mill officials figure Streambarker averages close to 13 cords per hour year 'round, "does the job faster . . . gets logs out cleaner and with fewer rejects than by conventional barking methods"!

Mill after mill can tell you about valuable savings — in stepped-up production, lower wood loss, better quality pulp — they're getting through Streambarker hydraulic log barking.

To figure accurately savings your mill can make, call your nearby A-C office, or write for "Streambarker Economics" bulletin B6391. ALLIS-CHALMERS, MILWAUKEE. A 2042

LOGS COME INTO Streambarker from pre-washing drum in which river water is used to remove ice and raise log temperature several degrees.

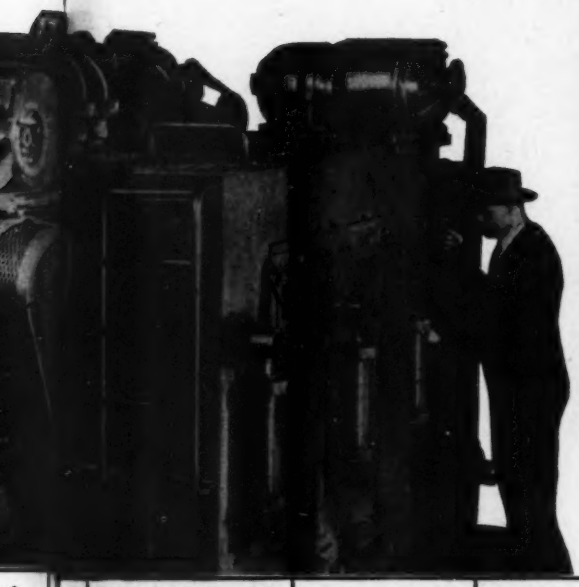
MILLS	Species of Wood Barked	Size of Logs Barked
MILL A	Spruce, Fir and Hemlock	4 to 18" diam., 4 ft. long
MILL B	Spruce, Fir and Poplar	4 to 18" diam., 4 ft. long
MILL C	Spruce and Hardwood	4 to 20" diam., 4 ft. long
MILL D	Spruce	4 to 18" diam., 4 ft. long
MILL E	Balsam, Hemlock, Spruce, etc.	4 to 20" diam., 4 ft. long
MILL F	Spruce and Fir	3 to 18" diam., 4 ft. long
MILL G	Spruce and Fir	3 to 18" diam., 4 ft. long
MILL H	Birch, Maple, Beech	4 to 18" diam., 4 ft. long
MILL I	Poplar and Spruce	4 to 20" diam., 4 ft. long
MILL J	Spruce, Fir, Pine, Hemlock	4 to 20" diam., 4 ft. long
MILL K	Pine, Birch, Poplar, etc.	3 to 20" diam., 4 ft. long
MILL L	Spruce	3 to 20" diam., 8 ft. long

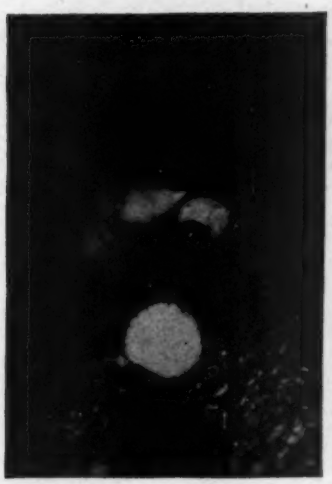
CHECK ACTUAL FIGURES REPORTED BY 12 DIFFERENT MILLS!

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—
Biggest of All in Range of Industrial Products

r WITH STREAMBARKER!





LOG GOES IN, is engaged by 2 bed rolls which revolve it under 3 high-pressure, bark-removing water jets.

LOG COMES OUT — bark *clean,* with *no* brooming of ends, with *no* dirt, and *no* surface rot!

Streambarker Schedule		Water Pressure		No. of Men, Convey., Barker, Inspec.	Capacity Cords per Hour		Process in which Streambarked Wood is Used	Method of Bark Disposal	Miscellaneous Notes and Mill Comments
Hours per Day	Days per Week	Summer	Winter		Summer	Winter			
16 to 24	6 to 6½	750 lbs.	750 lbs.	4	9	6	50% Sulphite 50% Groundwood	100% to Boiler	Installing hot pond for winter barking. Expect to improve operation.
9	6	670 lbs.	670 lbs.	3	10	8	100% Groundwood	100% to Boiler	"All steam generated by wood waste and bark," say Mill Officials.
24—auxiliary to drums	6 to 6½	650 lbs.	650 lbs.	4			Bleached Sulphite	Bark to Dump	Streambarker used on wood which other barking equipment cannot handle.
9 to 12	6	730 lbs.	730 lbs.	4	13	8½	88% Sulphite 12% Groundwood	100% to Boiler	"Pulp quality raised materially," say Mill Officials.
16	6	670 lbs.	770 lbs.	3 to 4	9½		60% Sulphite 40% Groundwood	Bark to Incinerator	Booster pump for winter barking has recently been installed.
Auxiliary to drums	6	750 lbs.	750 lbs.	3			Groundwood, Unbleached Sulphite	100% to Boiler	Streambarker barks wood which other barkers cannot efficiently handle.
24	6½	780 lbs.	780 lbs.	4	9	7	100% Sulphite	100% to Boiler	Streambarker is first full-scale barker this mill has installed.
17	6½	635 lbs.	635 lbs.	7 incl. unload, loading	9	7½	100% Soda	Bark to Dump	One of 1st Streambarker installations—yet low maintenance right along.
16	6½	750 lbs.	750 lbs.	4	10	7	100% Sulphite	100% to Boiler	"We've eliminated knot boring, hand-cleaning, etc.," state Officials.
24	7	650 lbs.	750 lbs.	3	9½	6½	50% Sulphite 50% Groundwood	⅔ to Boiler, ⅓ to Dump	Streambarker cleans logs that cannot be cleaned by other barkers.
8	6	675 lbs.	675 lbs.	5	10	6½	100% Soda	100% to Incinerator	"Barker operation and capacity both very good," say Mill Officials.
16	6	675 lbs.	675 lbs.	4	10	9½	50% Sulphite 50% Groundwood	100% to Boiler	Booster pump being installed to raise pressure to 775 pounds.

PREPARATION—Hydraulic Barkers, Chip Screens, Saws, Slashers, Grinders.

COOKING—Digesters, Blow Tanks, Kilns, Heat Exchangers, Condensers.

WET ROOM — Vibrating Screens for use as Thickeners, dewatering rejects, etc.

PAPER-MAKING — special drives for Paper Machines, Rewinders, Calenders.

POWER — all types of Power Generation, Distribution and Control.

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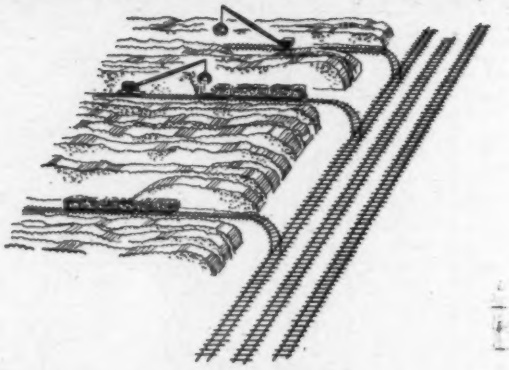
TEXROPE V-belt drives — fractional to 5000 hp — constant and adjustable.

PUMPS—Single and Multi-Stage, 10 to 150,000 gpm — Paper Stock Pumps.

Pulpwood: High, Wide and Then Some!

The new "American" Diesel-Electric Locomotive Crane makes rail-served pulp storage yards and stock piles more economical and convenient than ever before. And this efficient smooth-operating unit is the perfect answer to the private switching problem — powerful, easily controlled, smooth starting, fast moving, sharp turning. It is a most flexible and durable pulpwood-handler — engineered by "American" experts to handle more, for less, every working day. It piles high and wide and works safely inside buildings and out — is smoke and spark-free. Study all *your* storage requirements in the light of this new "streamliner of the storage yards." Individually designed diesel, gasoline and steam models are also available.



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Whittaker is manned and equipped to accept the challenge of your problems, too. Possibly one or several of the Whittaker minerals, colors and pigments may mean lower cost, faster manufacture or better quality in your products. Let Whittaker research help you find out. Write for full technical data, laboratory samples, or advice. For commercial quantities, place your order with Whittaker, fully assured of getting products that are laboratory tested for uniform high quality.

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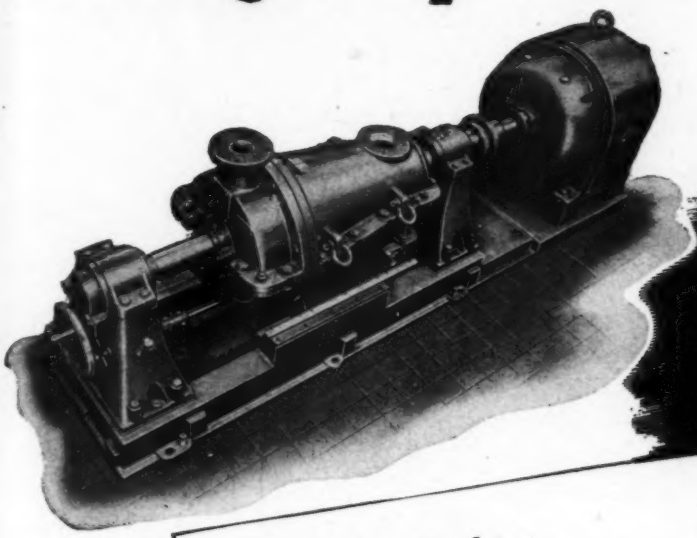

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In a mill making 100% rag ledger paper, the Jones High Speed Refiner refines stock at 40 H.P., (replacing a 100 H.P. Jordan), and produces stock at a range between 300 to 600 lbs. per hour.

APPLICATION No. 2:—

By further refining stock from beaters in a mill making rag electrical papers, the Jones High Speed Refiner reduces beating time considerably.

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In another mill, one Jones High Speed Refiner, with special filling, refines ground wood rejects thereby saving material which was formerly wasted.

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E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills

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Almost No Wear

Report Mills with Ryertex Grinder Bearings

"Could not measure wear after eighteen months." "No sign of wear in more than four years." "Bearing looks good for ten years." These are actual operating reports—the kind we get regularly from paper mills using Ryertex grinder bearings.

The ability of Ryertex to stand up under pressures of 32,000 to 36,000 lbs. per square inch makes it last and last even in tough grinder bearing applications. And long, trouble-free service is not the only economy of laminated-plastic Ryertex bearings. They're water lubricated, eliminating oil costs and the need for regular servicing. They have an extremely low coefficient of friction resulting in low power costs and high production.

Water lubrication of Ryertex does away with the oil that often spatters floor and equipment when metallic bearings are used. So safer and cleaner operating conditions are additional Ryertex advantages.

On every type of grinder in mills from Canada to Mexico, Ryertex bearings have proved their dependability. A Ryertex engineer will gladly furnish complete details on the type of installation in which you are interested. Write to—

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Ryertex Applications Include Bearings for:

Log Hauls	Refiners
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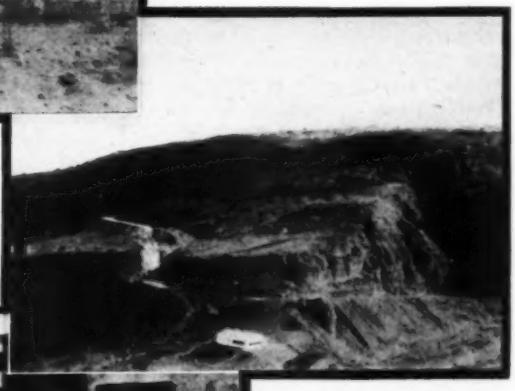
THE PAPER INDUSTRY
and PAPER WORLD

NOVEMBER, 1946

Wood Survey for New Mexican Mill

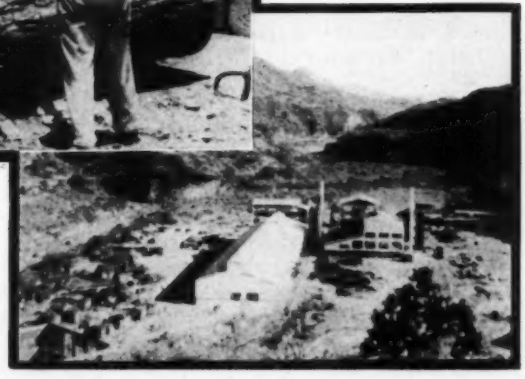
L. A. NIX
Consulting Forester

Left—Peon lumberjacks live in these shacks with their families. Shacks have no floors and are 3 by 4 meters



Right—Switch back roads coming up out of the Canyon at Atenquique

Below—Pulp and paper mill at Atenquique



Above—Bucking up logs into 3-ft. lengths in mill yard

▶▶▶ THE VITAL IMPORTANCE of forests to the economy of most of the countries of the world has been emphasized by the war. The shortage of forest products has caused many nations to take stock of their own forest resources in order to ascertain whether or not they can produce sufficient for their own needs.

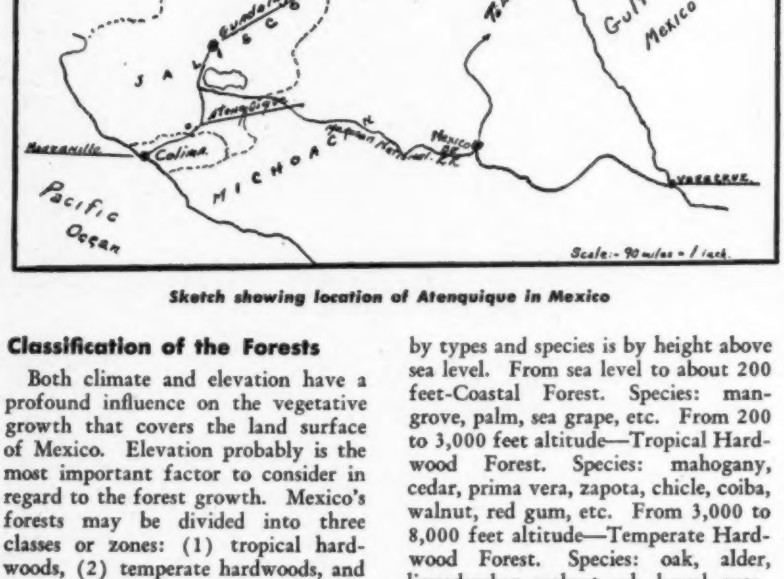
Although it has large and extensive forest resources, Mexico has been a large importer of various kinds of forest products. Paper of all kinds has been extremely short in Mexico.

The development of the kraft pulp and paper industry in the southern part of the United States (using southern pine as a raw material) has given Mexico a pattern to follow, pointing the way in which its own needs might be supplied from its own forests. That such a movement was not started sooner probably was due to several restricting factors, the most important one being topography.

Topographic Characteristics

Mexico's land surface is slightly less than one-quarter of the United States, comprising some 758,200 square miles. The country varies in width from about 120 miles across the Isthmus of Tehuantepec to about 1,300 miles along the northern boundary.

There is a mountain range on the East coast and also on the West coast with a high plateau in the center of the country. The topography is rough and badly cut up by gullies and canyons. The extreme difference in elevation has been an unfavorable factor in the exploitation of the timber resources. The development of transportation facilities has been slow, difficult, and costly. To get roads into the timbered areas has been one of the main problems to be solved. The lack of a proper solution of this problem is probably one of the reasons why Mexico has extensive virgin timber resources today.



Sketch showing location of Atenquique in Mexico

Classification of the Forests

Both climate and elevation have a profound influence on the vegetative growth that covers the land surface of Mexico. Elevation probably is the most important factor to consider in regard to the forest growth. Mexico's forests may be divided into three classes or zones: (1) tropical hardwoods, (2) temperate hardwoods, and (3) coniferous forests. All sizable tracts of timber are located in the remote and less accessible sections of each zone and before they can be exploited, some means of transportation, proper logging methods and conservative forest management plans must be developed. According to a report by H. Arthur Meyer, "Forestry & Forest Resources of Mexico," the areas of timberlands according to altitude are as follows:

Altitude in Feet	Land Area in Forest In Million Acres
0 to 1,600	42.0
1,600-3,300	10.6
3,300-5,000	6.4
5,000-6,500	7.7
6,500-8,000	2.7
8,000-plus	1.0

Forest Resources of Mexico

There are no known reliable estimates of Mexico's timber resources, although the Mexican Forest Service is engaged at the present time in making estimates and inventories. This will probably take several years to complete. Rough estimates place the volume at from 53 to 97 billion cubic feet on about 50 million acres of commercial timberland. The relation of hardwood forest resources to softwood is about 3 to 2. From the author's observation, the over-all stand per acre will be light. The stands are spotty wherever there are commercial stands of timber. The pine forests are fairly dense in places but there is much waste land where the density is sparse.

Altitudes govern the forest growth and a good way to classify the forests by types and species is by height above sea level. From sea level to about 200 feet-Coastal Forest. Species: mangrove, palm, sea grape, etc. From 200 to 3,000 feet altitude—Tropical Hardwood Forest. Species: mahogany, cedar, prima vera, zapota, chicle, coiba, walnut, red gum, etc. From 3,000 to 8,000 feet altitude—Temperate Hardwood Forest. Species: oak, alder, liquadembar, walnut, ash, laurel, sycamore, etc. From 8,000 to 11,000 feet altitude—Coniferous Forests. Species: pine, fir, juniper, cypress, etc.

The pine forests are, therefore, on the mountains of Mexico. The largest part of Mexico's coniferous forests are on the Pacific side of the Sierra Madre Occidental in the states of Chihuahua and Durango. A secondary belt of importance is found in the states of Guerrero, Oaxaca, Michoacan and Jalisco along the Sierra Madre del Ser. A third belt of lesser importance is in the Sierra Madre Oriental from Nueve Leon to Chiapas. It is generally considered that the above regions could be developed into a profitable business for either lumber manufacturing or pulp and papermaking. A start has been made to establish a pulp and paper mill in the second named region.

Pulp and Paper Industry

In 1941, a group of business men in Guadalajara (in the State of Jalisco) with a prominent financial organization incorporated the Compania Industrial de Atenquique S. A. to build a kraft paper mill. This mill plans to manufacture chemical pulp paper, caustic soda, etc. The place selected for building the mill was at Atenquique in the State of Jalisco. Atenquique is a small Indian village on the Mexican National Railway running between Guadalajara and Manzanillo, a port on the Pacific coast. The town is about 125 miles southwest of the Guadalajara, the capital of the State of Jalisco. Guadalajara is the second largest city in Mexico and is an important manufacturing and trading center. It is reported that there are two or three more mills being built at the present time and will be in production at an early date.

The Compania Industrial de Atenquique company is building a modern up-to-date mill surrounded by an attractive townsite filled with homes of novel design for their employees, with churches, recreational centers, trading centers, hotel and other facilities for making life healthy and enjoyable. The elevation of the town is about 3,500 feet and the climate is ideal. It never gets excessively hot nor does it ever get cold. The scenery surrounding the mill and townsite is impressive.

The town is situated at the junction of the Tuxpan and Atenquique rivers. The river valleys are canyons. High towering walls hedge in the village and as one looks north, he sees two towering, mist shrouded volcanic peaks towering 12,000 feet. The volcanoes are active. Steam issues from the crators. Pine forests clothe the sides of these towering giants. From the river valley, switch back roads climb the sides of the canyon walls. Stringed instrument music mingles with the rattle of the riveting hammers. Customs and costumes of old Mexico mingle with the modern industrial activities in connection with the construction of the mill and the logging in an interesting and impressive manner. Women in native dress with baskets on their heads wander from house to house selling food of various kinds. Packs of burros can be seen winding down the switch back roads from the ranches on top of the barancas with pack saddle loads hanging on their sides. Herds of cattle come down the roads to the river to drink, herded by cowboys wearing the large sombreros. At night one sees in the native quarters, little fires flashing here and there in the darkness; the peons are cooking their supper out under the stars. They sit around the little fires with serapes wrapped around their shoulders and big sombreros on their heads. A simple, kindly folk living close to nature as they have lived for a thousand years and trying to adjust themselves to the ways of the modern industrial world. Can they do it? The author believes they will.

Timber Resources for the Mill

The mill, which is expected to be in production this fall, will use about 200 cords of wood daily. The timberlands required to supply the wood for the mill are situated within a radius of 60 miles. Timber being as close as five miles from the mill and

Left—Cutover area—pulpwood logs lying about

Below — Branch road building in the woods

Right—Burro does a good job of transportation for the peons

Above — Peon at work cutting logs

as far as 60 miles to the outside boundary of the holdings. Five or six counties have been set aside for the mill by presidential decree. No pine or fir timber can be cut for any other purpose. The timberland owners in this area are compelled to sell their stumpage to the company for pulpwood.

While there is no definite estimate made of the amount of timber in the area, it is considered by the government forest experts and company management that there is ample pine and fir timber in the area to supply the mill's needs. It is estimated that the company has had allotted about 500 square miles of pine and fir forest lands and this can probably be augmented by shipments of wood which will come to the mill by rail haul from outside the allotted area. As a guess, the author would place the wood supply allocated to the mill at from 3 to 4 million cords. On a 25-year rotation basis, the company probably can safely count on from 125,000 to 150,000 cords of wood supply from this area on a sustained yield basis. The potential growing possibility on the area if fire can be kept under control and some artificial planting done, will probably be around 250,000 cords annually.

Species of Wood Available for the Mill

The species of pine and fir are as follows:

1. *Pinus ayacahuite*—75 to 100 feet tall and up to 4 feet in diameter. Wood is soft, white, uniform in texture and equal to the white pines in the United States. Range is Durango to Guatemala. Common names are Pino ayacahuite, Pino real, Ocote blanco and Ayacahuite.

2. *Pinus leiophylla*—80 feet tall and up to 3 feet in diameter. Wood is soft, light and weak (intermediate between the white pines and yellow pines). Range is New Mexico to Oaxaca. Common names are Ocote, Chino, Pino blanco and Ocote blanco.

3. *Pinus teocote*—up to 120 feet in height and 3 feet in diameter. Wood is soft to relatively hard, reddish yellow and resinous. Range is from Tamaulipas to Chiapas. Common names are Ocote, Pino real, Jolicote, Teocote. This species is in the Sierra Madre Oriental but may also be in the West coast mountain range.

4. *Pinus montezumae*—up to 180 feet tall and 3 feet in diameter. A valuable tree yielding a fairly soft, white to yellow reinous wood. Range is Northern Mexico to Guatemala chiefly at altitudes of 6,000 to 8,000 feet. Common names are Pino real, Ocote blanco, Ocote hembro, Pino montezumae.

5. *Pinus lumholtzii*—up to 80 feet in height and 4 feet in diameter. Wood is rather light, soft, weak and resinous. Range is Northern Mexico to Vera Cruz and Oaxaca. Common names are Pino triste, Ocote blanco, Pino real and weeping or sad pine (U.S.A.).

6. *Abies religiosa* is the timber fir of Mexico. It is a large tree, sometimes 180 feet in height and 6 feet in diameter. It occurs at elevations of 4,000 to 11,000 feet. The wood is similar to that of United States western firs. Common names are Cyamel, Abete, Acxoyatl, Huallame, Guayama, Pinobeto and Pino.

The writer considers the above species to be the principal species in the area set aside for the mill.

Forest Management

Timberlands both private and public are under government control and Mexico has a very good forest policy and management plan backed up by a very comprehensive forest law. Before any cutting can be done, a permit to cut must be obtained from the government forestry district office. This office on request sends out for-

esters to mark the trees that can be cut. At the time of marking, they caliper the trees selected to be cut and blaze each tree a few inches from the ground and hammer stamp the tree. After they have computed the volume of wood marked in cubic meters, a permit is issued to the operator advising him regarding the number of trees and the volume of wood he can cut in a given camp operating area.

When the operator starts cutting, he must cut the stumps close to the ground and must clean up and pile all the wood not taken for pulp out of the branches and tops down to a minimum diameter of about one centimeter. Any other debris left is scattered around on the ground. There is really practically nothing left. Wood that does not go into pulp is used for fuel at sugar plants and for brick kilns. Mexico utilizes 90 per cent of every tree cut for some purpose or other.

The percentage of trees cut from each area varies from 25 to 60 per cent of the total stand depending on the density of the stand and the amount of reproduction. The large, mature trees are cut and the smaller rapid growing trees are left. This selection method of cutting means that the wood delivered to the mill will be about 75 per cent over 20 inches in diameter. Since the chipper spout at the mill will not take blocks of wood over 18 inches in diameter 75 per cent of the wood going into the mill will have to be split or quarter sawn. The selection basis of cutting is used in order to open up the forest for natural regeneration of the pine stands.

Since this region has only two seasons, namely, 8 months dry season from October 15 to June 15 and a four-month rainy season from June 15 to October 15, it is necessary to keep a good coverage of trees on a cut over area in order to prevent excessive drying out of the soil during the long dry period. This drying out of the soil would cause the young reproduction to dry up and die. Also if all the trees were removed there would be very much greater erosion than is now the case. There is considerable erosion in the open country because in the rainy season there is a very rapid runoff because of the steepness of the topography. Forest cover helps to keep the soil in place. Clear cutting would be disastrous to Mexico's forests, if allowed.

Reproduction generally in most places is quite good and adequate to keep the cutover areas well stocked with trees. In some areas, due to a custom of burning over the lower cattle range areas during the dry season, the fires get out of control and run over into the forests. There is ample evidence of this fact in the fire scars that can be seen on the large trees in the forested areas. These scars indicate that most forested areas have had fires going through them on various occasions during the life of the forest. These fires kill all young reproduction but do not do too much damage to the large trees. The fires are ground fires and since the forest floor is usually fairly clean of debris and underbrush there is not enough heat generated to carry the fire to the crowns of the large trees.

The Mexican forestry officials recognize the damage fires do to young growth and are attempting to keep down the incidence of them to the minimum. In the region of the company's timberland there are forty fire patrolmen watching the area. They travel on horse back and are armed and have the authority to make arrests for trespassers and any one starting a fire or being careless with fires. There are no towers for detecting and no telephone system for reporting forest fires. The company does own an airplane and this plane in its travels between Guadalajara and the mill often reports forest fires. It seems to the author that the government will have to set up a better detection system and that prevention propaganda will have to be used. One of the purposes of propaganda will be to educate the land owners, small peon farmers and cattle ranch owners to be careful with fire. It will be a difficult job to educate these people in fire prevention because it has been the custom for centuries to burn the range lands and only recently did it matter very much if the fire got into the timbered areas. The fire simply runs up the mountain side until it gets to the timber line and then goes out. So in the minds of the peons why worry too much about it. Another source of fire is the custom of the peons to build little fires to cook their meals. During the rainy season at high elevation, there are terrific lightning storms sometimes with very little rain. These storms cause many forest fires which are difficult to extinguish because there are no roads and very poor trails, or none at all. In Mexico, as in other countries, it is hard to break down ancient customs or practices and this is especially so in Mexico at the moment because many of these country people do not read; they have no radios, and there is no way to reach them to educate them in the value of the forest and the damage that fire does to them. A possible means of spreading a "save the forest" propaganda would be through the church. Most of the peons are devout church goers and the priests would gladly co-operate in a campaign to prevent fires in the forest.

In some areas, where there is inadequate reproduction, artificial reforestration may be necessary. The company is seriously considering the policy of planting where necessary in order to have the land under its control producing all the wood that it is capable of growing. A nursery may be established at Atenquique to experiment with the idea and it will be determined later after more information has been compiled on its forest resources whether it will be necessary to use artificial methods or not.

Forest Surveys

The company early recognized the usefulness of mapping its timber holdings by aerial photography. It has a large portion of its timberlands photographed and has taken steps to obtain the proper instruments for interpreting the photographs so that they can be put together into mosaics from which accurate line maps can be made showing the location of the timber. The photographs can also be used in estimating the volume of timber on any area and for laying out roads, cutting areas and cost budgets for the operations. Aerial surveying is especially useful in Mexico because the conventional strip method across the topography of obtaining information for timber estimating is in some cases almost impossible because the country is cut up by deep canyons which are difficult and in some cases impossible to cross. Timber cruising in the mountains is done mostly on horseback. A forester or logger with a forest ranger rides through the timbered area and locates his roads and cutting areas, then later follows this up by instrument men who lay out the roads on the ground. All this hard preliminary traveling can be cut to a minimum by the use of aerial photographs and the company has the photographs. All they need now is technicians to give them the information which the photographs contain and put it to use in the job of getting out wood for the mill.

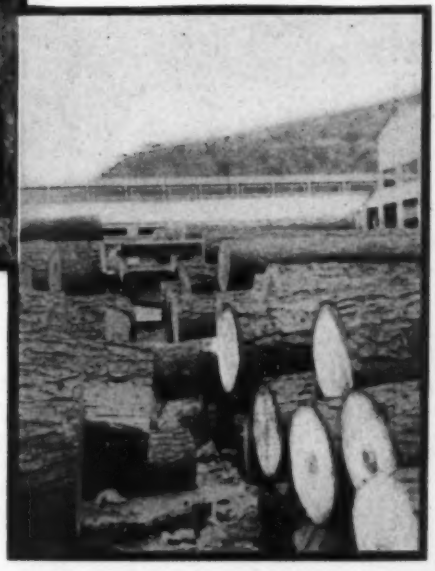
Logging Methods Old and New

One of the first steps necessary to open up the timber holdings of the company in order to make the wood available to the mill was to build motor roads. It was realized that native methods of getting out wood could not supply a sustained quantity of wood sufficient to keep the mill in production. Location surveys were

Below — View of pine forest before cutting

Above — Panoramic view of rough wooded country

Above—Cutover area-logs rolled to motor road in foreground



Right—Wood yard at mill. Notice large size of pulpwood blocks

made; estimates for construction of a good motor road were computed and a budget of 10,000,000 pesos set up to build about 400 kilometers of main motor road which will surround and tap all parts of the company's timber holdings. In as much as this road was surveyed to connect up various towns and settlements in the vicinity of Atenquique and tie into the Mexican National Highway System, the government will pay for such portions of this road as meets the specifications of the national highway systems of the country. Branch feeder roads will have to be built from the main trunk line road into the timbered areas. At the present time, this road-building program is well started and good progress is being made with its construction. The company has plans to cut and deliver its wood by the most advanced logging methods. It has ordered tractors, skidding arches, loading equipment, chain saws, and various American made hand tools and trucks both large and small with semi-trailers for the large trucks.

Early Logging Methods

Previous to the advent of the sawmill, logging in Mexico, especially in the State of Jalisco and in the area surrounding Atenquique, was very crude. Very little lumber was required and the small amount needed for building and simple furniture was produced by the peons in the following method:

The peons went into the forest with crude hand made axes and saws, cut down the accessible trees, rolled them by hand sometimes as much as 300 meters to a mountain trail, then sawed them up into the desired dimension with a whip saw or hewed them with an axe. They lashed the pieces of lumber on each side of a burro and dragged the lumber down the mountain trails to the villages and ranches in the vicinity of the forest and sold the lumber to anyone wishing to buy it. The tops and branches were cut into fuel and packed by the burros into the villages and sold. While the peon was in the forest, he slept in the open under a tree and used his serape for a cover. His food was beans and tortillas, a pancake affair made out of lye-treated ground corn. Tortillas and beans are eaten with

Left—Small truck coming out of woods with pulp logs

Right—Houses being built for employees in Atenquique townsite

chili and perhaps goat milk and meat.

Soon after the company was incorporated, the government allowed a subsidiary company made up of timberland owners within the area set aside by presidential decree, to cut some of the pine for saw logs and lumber. This move was permitted to produce lumber for war purposes and a considerable quantity of lumber was produced and shipped to the United States. Lumber was also needed for the construction of the pulp mill at Atenquique. The subsidiary company had four or five portable sawmills supplied by logging operations in the allotted lands.

The labor mostly peon was unskilled according to northern methods in logging. The company brought skilled sawmill and logging personnel from United States and operations were started. The trees were cut down with crude native saws and axes and were skidded and yarded to motor roads which were constructed by pick and shovel hand labor. Skidding consisted for the most part of rolling the logs down the mountain sides to the motor roads. In some cases they were skidded with teams of oxen. Labor was very cheap. The daily rate paid was as low as three pesos per day, about sixty cents in United States funds, and these men provided their own food and shelter. Costs were very low as compared with similar operations in United States or Canada. As soon as the company could get them, tractors with winches and American made hand tools were obtained for cutting and skidding the logs to the motor roads. Small Ford and Chevrolet trucks were used for hauling the logs to the portable sawmills. The hauling distance was usually short. These operations have trained a considerable labor force for woods operations so that today there is probably enough partly trained labor to carry on the woods operation for the mill. There seems to be plenty of good truck and tractor operators in Mexico and many eager to learn. The preliminary ground work has been done so that the company should be able to swing into modern logging methods without too much grief.

Proposed Methods of Operation

The organization will be similar to that used by other pulp and paper companies consisting of a woods manager, accounting, forestry, logging, transportation, and personnel division with qualified personnel heading up each division. There will be four or five operating units which will deliver wood from the stump to the mill as follows: Cutting gangs of three men will cut down the trees either with a crosscut saw or a chain saw and trim them in tree length. D6 Caterpillar tractors will yard the wood in tree lengths up to a distance of 500 to 600 feet to the main skidding trails. Then D7 or D8 tractors with skidding arches will skid the tree lengths up to a distance of 4,000 feet to a yard where the logs will be cut up into lengths of five feet, or multiples of five, and loaded with conveyors onto trucks. Small trucks will haul the wood up to ten miles directly to the mill yard. Distances of over ten miles, the logs will be reloaded onto trailer trucks. The trailer trucks used will be five-ton Mack with semitrailers and the maximum load will be about eight cords. The trailers will be spotted at the junction of the main and feeder roads and the Mack tractor trucks will shuttle back and forth between the feeder roads and the mill.

The company plans to gradually provide better living quarters for its woods labor. Panel or portable camps are being considered and stores will be established in the woods so that the employees can buy their food and other needs. The peons like to take their families with them into the woods so it is planned to set up schools for the children. There will be a hospital with a few beds and trained first aid attendants under the direction of a doctor at each camp so that injuries and sickness will be looked after. It is very healthy in the mountains and there is very little sickness. There are no mosquitos so the incidence of malaria is very low. Any malaria that shows up in the camps is the recurrent variety which comes back periodically with individuals who have had the disease. There is some trouble with scorpion and snake bites, but as the first-aid attendant has the proper serums for treating these bites, there are very few fatalities. The company will have good medical personnel and a hospital at Atenquique to take care of its employees both in the mill and the woods.

Conclusion

It is the author's opinion that the company has ample wood supply and is planning and building an organization that will be able to supply wood to the mill in an efficient manner and at a cost comparable to that in the southern United States. Forest management plans will insure a continuous supply for the future and this industry will add much to an improved standard of living for the people of this part of Mexico and will enable Mexico to start using one of her important natural resources for the good of her own economy.

Experimental Manufacture of Paper for War Maps

CHARLES G. WEBER and MERLE B. SHAW*

● *A NEW MAP PAPER was developed early in World War II that greatly improved the quality and performance of war maps. The National Bureau of Standards co-operated in the development and, subsequently, determined by experimental manufacture how to make the paper from commercially available raw materials. The best results were obtained in experimental manufacture by using fiber furnishes of 100 per cent strong bleached sulphate pulps with melamine formaldehyde resin for wet strength and titanium dioxide for opacity. It was essential that the beating be very carefully controlled to preserve the maximum fiber strength. The most critical requirements from a manufacturing standpoint were the very high resistance to tear, high wet tensile strength, high opacity, and good smoothness. A moderate degree of wildness was not objectionable. The data obtained by experiments were applied to initiate the commercial production of the new paper to meet unprecedented tonnage requirements.*

▶▶▶ THE PAPER SECTION of the National Bureau of Standards co-operated actively with the Army Map Service of the Corps of Engineers in the development of a new type of map paper that proved highly important during World War II. Unique qualities built into this paper gave satisfactory performance in contact with the water, mud, and grime of the battlefield that had disintegrated papers heretofore used. An important role of the Bureau in the development consisted in assisting to bring the new type of paper into commercial production after its merits were established. Information essential to this step was obtained through semicommercial papermaking experiments. A detailed specification (*1*) for the paper was formulated at the Army Map Service, with the co-operation of the Bureau. The most important feature of the paper was its high wet strength, which was obtained by the relatively new development of resin bonding (*2,3,4*).

The requirements of the specification were very stringent. They called for the rugged strength dry, wet, and oil soaked, that gave the maps their durability. In addition, they called for: low expansivity; high opacity wet, dry, and oiled; good writing quality wet or dry; low acidity; and smoothness suitable for printing multicolor line maps and 200-line photomaps. Close limitations were placed on thickness, weight, and moisture content.

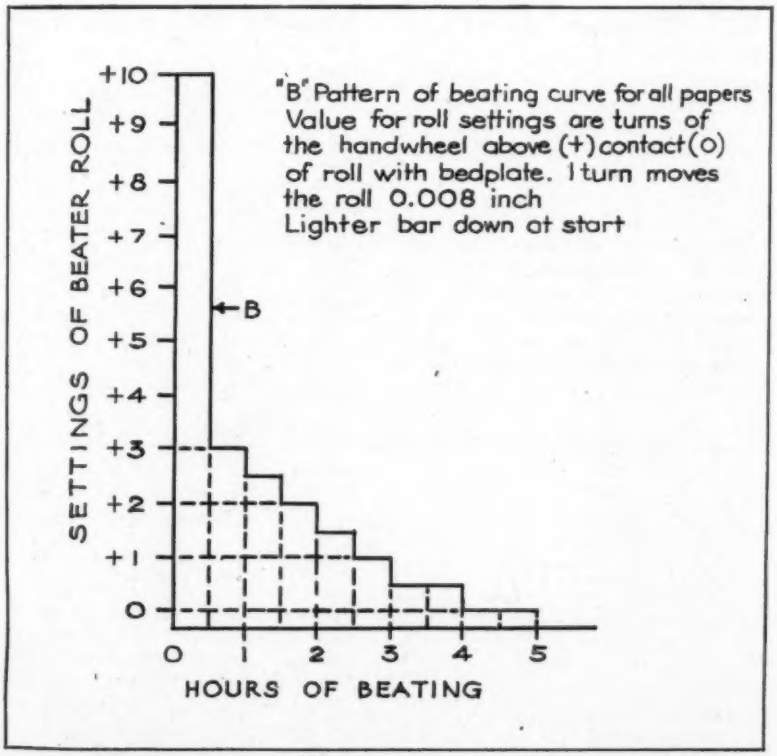


Fig. 1—Standard practice of lowering the beater roll for all experimental map papers

The papermaking experiments determined how the paper could be made from available raw materials to meet the specification.

The information obtained was applied with much success in assisting commercial mills to get into successful production of the paper with a minimum of delay. It was of great value also as a basis for judging from the properties of papers not meeting all details of the specification, changes in composition or manufacturing technique necessary to bring the papers up to standard.

When it became important to explore the possibilities of saving space and weight in the shipment of maps by air, the results were especially useful. With the data at hand, it was possible for the paper section to produce quickly, in quantities sufficient for printing trial lots of maps, papers embodying optimum qualities obtainable in lighter weights. The maps from these printings were used by the Army engineers to establish the utility and durability of lightweight maps.

Experimental Papermaking Equipment

The equipment of the Bureau's paper mill is semicommercial in size, and is adapted to the experimental manufacture of papers under conditions which simulate those of industrial plants. Detailed descriptions and photographs of the equipment are contained in previous publications (*5,6,7*). The equipment used in this particular

(*) Other members of the paper section contributed to this work. Particular acknowledgment is made to Martin J. O'Leary and Joshua Missimer for assistance in papermaking and to Thelma L. O'Brian, William K. Wilson, Irma G. Callomon, and Alice J. Padgett for testing.

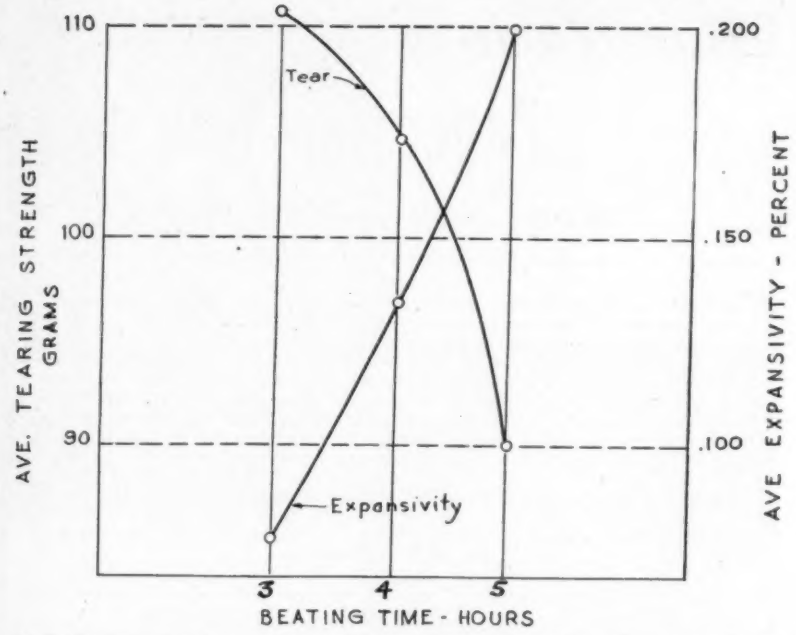


Fig. 2—Relationship between degree of beating and expansivity and tearing strength of experimental map papers

work consisted essentially of: a 50-pound beater with copper-lined wooden tub and manganese-bronze bars and plate; a jordan refiner with bars of bronze and steel alloy; a 4-plate, flat screen; a 29-inch four-drinier papermaking machine with a wire 33 feet long, two presses, nine 15-inch dryers, a machine calender stack of seven rolls, and a reel; and a 5-roll supercalender.

Fibrous Raw Materials

The extremely high strength required for the map paper made it essential that all or a large proportion of the fibers used be of high strength. Rag fibers were not given consideration because neither an adequate supply of rags nor sufficient rag-cooking equipment was available to meet anticipated needs. Hence, the experiments were confined to commercially available bleached wood pulps. The following pulps were used either singly or in mixture:

1) Northern bleached sulphate, made by cooking eastern spruce in a strong solution containing caustic soda and sodium sulphide. This was very strong, long-fibered wood pulp.

2) Bleached sulphate No. 2, made from mixed species of relatively poor wood. This was somewhat like No. 1, but softer and weaker because of the lack of adequately selected woods at the producing mill.

3) Western bleached sulphate, a very strong wood pulp made from western hemlock. It was comparable to No. 1 in quality.

4) Bleached sulphite, made by cooking eastern spruce wood in a solution of calcium bisulphite. This was a standard quality of pulp used for bond papers. It was a relatively long-fibered, strong pulp, but not as strong as the sulphate-cooked pulps made from selected woods.

5) Deciduous wood soda, a filler pulp produced by cooking wood in a strong solution of caustic soda. This was an unusually strong soda pulp; however, no pulp of this type is comparable to the sulphate or coniferous sulphite pulps in strength or length of fibers. Its use in a paper contributes to printing quality and formation of paper rather than to the strength.

6) Deciduous wood sulphite, a short-fibered filler pulp made by cooking deciduous woods in a solution of calcium bisulphite of calcium. It is comparable to soda pulp in most of its characteristics.

The chemical characteristics of these pulps are shown in Table 1.

Manufacturing Procedure

Before the furnish was added to the beater, the roll was raised off the plate a definite number of turns. The position of the beater roll is expressed as the number of turns above (+) or below (—) zero setting, which is the point of contact between the roll and the bedplate. One turn moves the roll 0.008 inch. The various positions of the roll and the time intervals for each during the beating of a furnish are shown in Figure 1.

Forty-eight pounds of pulp was furnished to the beater in each instance. The pigment, titanium dioxide, was added during the furnishing. After the furnishing, which took about 15 minutes, the beater roll was gradually lowered by definite steps at fixed intervals through the beating, as indicated by the beating graph in Figure 1. The rosin size was added 1 hour, and the alum (aluminum sulphate) ½ hour, before completion of the beating cycle.

The beaten stock was dropped to a chest and pumped in a continuous stream through the stuff box and the jordan to the paper machine without the use of a machine chest. The stuff box was of the familiar regulating type, having a constant head over an adjustable orifice. Screen plates with 0.018-inch slots were used for all runs.

TABLE 1—Chemical characteristics of fibrous materials used in experimental manufacture of war map papers

Pulp	Alpha-cellulose content (per cent[1])	Beta-cellulose content (per cent[1])	Gamma-cellulose content (per cent[1])	Pentosans (per cent)	Copper Number	Ash (per cent[2])	Resin (per cent[2])	Acidity of pulp (glass-electrode method) Cold-water extraction (pH)	Acidity of pulp (glass-electrode method) Hot-water extraction (pH)
1. "Northern" bleached sulphate	85.4	8.6	6.0	6.5	0.7	0.1	0.1	5.8	5.3
2. No. 2 bleached sulphate....	83.8	10.2	6.0	8.1	1.9	0.3	0.1	6.1	5.5
3. "Western" bleached sulphate	86.3	6.3	7.4	5.2	0.9	0.2	0.1	6.7	6.2
4. Coniferous-wood sulphite ...	84.4	3.6	12.0	4.2	1.3	0.2	0.4	5.8	5.5
5. Deciduous-wood soda	84.6	13.1	2.3	15.3	1.3	3.0	0.4	4.2	3.6
6. Deciduous-wood sulphite ...	83.6	10.9	5.5	6.0	1.0	0.2	0.1	6.9	6.2

[1] Based on total cellulose. [2] On oven-dry basis.

The jordan was used as a mixer only, on the same setting for all runs.

When melamine-formaldehyde resin was used, it was added as a colloidal solution made by dissolving the resin in the form of a fine white powder, in warm water acidified with hydrochloric acid. The solution was added continuously to the stock leaving the screen, just before it entered the head box of the paper machine. The stock was uniformly mixed by baffles in the head box and the temperature of the stock was maintained at 90 deg. Fahr. ± 2 deg. at that point.

Rosin size was used in all papers. It was precipitated with papermakers alum ($Al_2(S_4O)3$, which was used to control the *p*H of the stock. The papers were opacified with titanium dioxide. The finish imparted by the small machine calender was insufficient and it was necessary to improve the smoothness by light supercalendering.

Testing

All physical and chemical tests of the pulps and papers referred to in this article were made in accordance with the official methods (*8*) of the Technical Association of the Pulp and Paper Industry. Wet bursting strength and wet tensile strength were determined on samples immediately after immersion for one hour in water at 73 deg. Fahr., using the same procedure as for corresponding tests on samples conditioned in the normal manner. The *p*H of mill waters at the beater, stuff box, and head box was determined electrometrically, using a quinhydrone electrode.

Results

The first papers were made of all eastern sulphate. It was the strongest bleached commercial wood pulp available at the time, and the first problem was to determine how to make the best possible paper from it. By making a series of papers, varying one factor at a time, it was established that the most suitable map paper produced was made with only 3 hours of beating with the jordan set for mixing only. The sheet had a "wild" formation (*9*) when judged by the time-honored method of looking through it. However, visible formation *per se* was of no importance and no reference was made to it in the specification. Tearing strength and wet tensile strength in the cross direction were the most critical properties from the control standpoint. More than 3 hours of beating resulted in low tearing strength and correspondingly high expansion. This relationship is shown graphically in Figure 2. This control of beating was absolutely essential to the production of a paper with satisfactorily high resistance to tear and low distortion.

High wet strength and important increase in the dry or normal strength was obtained by using melamine-formaldehyde resin. Three per cent was required to obtain the necessary wet strength and more than 3 per cent reduced the resistance to tear rather sharply by a continuous film effect.

Some difficulty was encountered in obtaining reasonably high retention of the opacifying pigment when the melamine resin was first used. A control paper without this resin, with 3 per cent of titanium dioxide added, had a opacity value of 93 per cent. The next paper made was a duplicate except that 3 per cent of melamine resin was added. Less alum was required to adjust the *p*H because the resin solution added was strongly acid. Poor retention of pigment resulted and the opacity dropped to 86 per cent. The loss of pigment was found to be caused by a deficiency of alumina present from hydrolysis of the alum. It was corrected by adding an excess of alum and then adjusting the *p*H with sodium carbonate. Apparently, the important role in holding the particles of pigment to the fibers is played by positively charged alumina, which acts as an electrostatic cement between the fibers and the pigment, each of which carry negative charges. The use of sodium phosphoaluminate as a source of alumina, which does not reduce *p*H, had little effect on retention. However, by adding an excess of alum, excellent opacity was again obtained. Thereafter, three per cent of alum, plus sufficient sodium carbonate to give a *p*H of 4.5 at the head box, was used in all instances. These results are in complete agreement with the published findings of Martin and Willets (*10*) regarding the influence of the positively charged alumina on the retention of fillers in paper.

It was found possible to meet all of the requirements of the specification using 100 per cent of either eastern sulphate or western sulphate pulp. However, attempts to obtain satisfactory strength when using the sulphate made from mixed species of wood of poor quality were unsuccessful. Apparently the presence of short, soft fibers from deciduous woods reduced the fiber strength below the minimum required for this quality of paper. Figure 3 shows a comparison of some of the most important properties of the best papers that could be made using various fiber furnishes.

Attempts to extend the strong, and somewhat critical, sulphate pulps by the addition of filler pulps were only partially successful. The addition of as little as 12½ per cent of deciduous wood sulphite or soda, both high-grade filler pulps, resulted in failure to meet the specification in some respects. Even coniferous sulphite, which is a relatively strong wood pulp, could not be used in amounts over about 10 per cent, without failure to meet the required tearing strength.

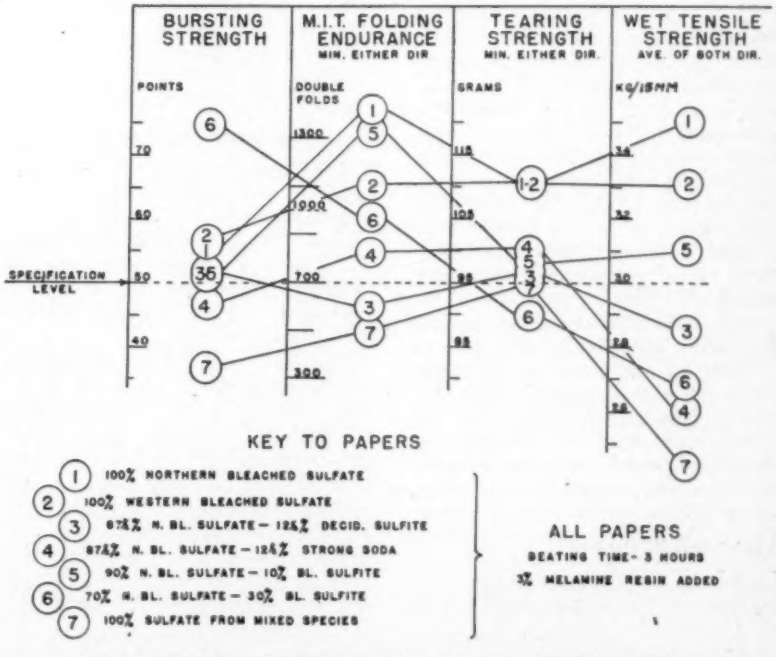

BURSTING STRENGTH
POINTS
M.I.T. FOLDING ENDURANCE
MIN. EITHER DIR
DOUBLE FOLDS
TEARING STRENGTH
MIN. EITHER DIR.
GRAMS
WET TENSILE STRENGTH
AVE. OF BOTH DIR.
KG/15MM
SPECIFICATION LEVEL
KEY TO PAPERS
1 100% NORTHERN BLEACHED SULFATE
2 100% WESTERN BLEACHED SULFATE
3 87½% N. BL. SULFATE – 12½% DECID. SULFITE
4 87½% N. BL. SULFATE – 12½% STRONG SODA
5 90% N. BL. SULFATE – 10% BL. SULFITE
6 70% N. BL. SULFATE – 30% BL. SULFITE
7 100% SULFATE FROM MIXED SPECIES
ALL PAPERS
BEATING TIME – 3 HOURS
3% MELAMINE RESIN ADDED

Fig. 3—Relationship between fiber furnish and some strength properties of experimental map papers

TABLE 2—Test data on commercial, wet-strength map papers from nine different mills of wide geographic distribution

Property	Manufacturer A	B	C	D	E	F	G	H	I	Specifications requirements
Weight, 17 x 22: 1000, lb.	49.0	47.7	48.7	49.2	49.1	48.8	47.7	47.1	46.6	48 ± 10%
Thickness, inch	.0043	.0043	.0043	.0045	.0044	.0043	.0043	.0042	.0043	.0040 ± 10%
Bursting strength, points	64	55	55	69	55	54	47	51	55	50 Minimum
Bursting strength, wet, points	30	23	24	35	29	29	27	24	24	20 Minimum
Tearing strength, grams										
Machine direction	95	95	100	103	101	93	106	104	100	95 Minimum
Cross direction	110	107	109	121	130	101	118	122	109	95 Minimum
Tensile strength, wet, kg/15 mm.										
Machine direction	4.4	3.9	3.9	4.5	3.6	3.7	4.4	4.9	3.9	3.5 Minimum
Cross direction	2.9	2.6	2.5	2.9	2.5	2.5	2.6	2.5	2.5	2.5 Minimum
Folding endurance (MIT), double folds										
Machine direction	1590	1070	1460	1355	1040	1330	1280	1240	1460	700 Minimum
Cross direction	940	805	720	1295	1050	1440	740	770	720	700 Minimum
Smoothness (Bekk), seconds	63	53	46	37	43	42	55	51	46	50-100 Minimum
Opacity, per cent	91	92	93	93	90	90	91	90	93	91 Minimum

Application to Commercial Production

With the information developed in the experimental work, it was possible to give maximum assistance in extending the commercial manufacture of the paper to widely distributed mills to meet quickly the unprecedented needs of the Armed Forces. Technical service was provided for mills on their initial orders and more than a dozen mills were able quickly to make paper meeting the very high standards of the Armed Forces. Table 2 contains pertinent data on the properties of 9 map papers made early in the program at widely distributed commercial mills. All of these mills initiated the manufacture by following specific technical instruction from the Bureau based on information obtained in the experimental work. The success in applying the information is shown by the consistent manner in which the various papers conformed to, and in many instances exceeded, the most difficult requirements of the specification. Production exceeding 10,000,000 pounds per month within approximately six months after initiation of commercial manufacture of an entirely new type of paper was accomplished with a minimum of delay or loss of critical raw materials.

That these papers were well made is attested by the following statement in a letter of commendation from the Office of Chief of Engineers: "Millions of maps have been printed on this high wet-strength paper and their superior durable qualities have proven eminently satisfactory to troops in all theaters of war."

Lightweight Paper

Late in the war, the Army Map Service investigated the possibility of reducing the shipping weight and bulk of maps. To aid in this work, the Bureau made a number of experimental runs and determined the qualities that could be obtained in reduced weights. The Map Service was furnished with sufficient quantities of two experimental papers, 12½ per cent and 25 per cent below the standard weight, respectively, for printing and performance tests. When the performance of the lighter paper was found to be sufficiently promising to justify commercial-scale purchase, the paper section had the data for a detailed specification. This paper was composed of 100 per cent northern or western bleached sulphate with 3 per cent of melamine resin for wet strength and 3 per cent of titanium dioxide pigment for opacity. It was made with absolute minimum of beating to preserve the fiber strength. The resulting tendency to "wildness" in formation did not affect adversely the printing characteristics or appearance of the finished maps.

Summary and Conclusions

The development of the improved paper for war maps and the commercial manufacture of it were accomplished through co-operative effort. The Bureau was particularly active in determining how the paper should be made from available materials for optimum performance.

The best results were obtained in experimental manufacture by using fiber furnishes of 100 per cent strong bleached sulphate pulps with melamine-formaldehyde resin for wet strength and titanium dioxide for opacity. It was essential that the beating be very carefully controlled to preserve the maximum fiber strength. The most critical requirements from a manufacturing standpoint were the very high resistance to tear, high wet tensile strength, high opacity, and good smoothness. A moderate degree of wildness was not objectionable.

A lightweight paper was developed that reduced the shipping weight and bulk of maps by 25 per cent. It was composed of 100 per cent of the strongest bleached fibers with 3 per cent of melamine resin and 3 per cent of titanium dioxide. It was made with absolute minimum of beating.

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9) A paper is said to have wild formation when the fibers are so distributed as to present a mottled, streaked, or "curdled-milk" appearance when viewed against light.

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MORALE SURVEY
Improves Management-Employee Relations

▶▶▶ AN UNEXPECTED conference of plant supervisors, executives, and foremen was called by the president of a large paper manufacturing firm. Because this conference followed within a few days of the regular semi-monthly meetings, all minds were rife with speculation.

The president opened the meeting by saying, "I can secure accurate and reliable information from each of you for your divisions. You have on the tip of your tongue the production record for the day, week, month or year; you know or can immediately place your fingers on production cost data; our inventories account for every machine and all materials for processing on hand as well as shipped paper and the current stock. Yes, these are important to the success of our business."

"I am also sure that were I to ask you for the total payroll of your department you could give it to me. You could without hesitation tell me the number of people and the classifications of their jobs. These are all matters we discuss from time to time. Each one of us familiar with the ideas and attitudes of the other toward management policy matters. Today I want to ask you another question which I hope you will be able to answer with equal frankness and accuracy."

"All of the things we have been doing are important, but I wonder if we are not overlooking an equally important if not even more important responsibility of management. Human beings in the final analysis are the most important part of our and every other business. The men and women behind the machines, yes, even the man behind the broom is important to our success or failure, but can you tell me with complete confidence the attitude of our employees toward their jobs, you (the boss), and the company?"

There were anxious glances, worried looks and random statements to the effect that the organization was one big happy family. The boss persisted with such difficult questions as, "How do you know?" "Are you sure?"

He finally cut loose with a lecture on the dangers and penalties of guessing, especially in the field of industrial human relations. He pointed out with considerable emphasis that processing and manufacturing steps were based upon knowledge which had been tested and proven. That equipment and machinery are selected according to established standards. Concluding his statement were these words, "Apparently the only aspect of business in the diaper stage is the most important, namely, its employees, human beings, who are considered on a par with ordinary commodities." The result of the session was the designation of a committee to confer with the president on ways and means of accurately determining what the employees' true attitudes were toward the job, the boss, and the company in order that the paper mill's employer-employee relations program could be established on a firm foundation of fact.

EUGENE J. BENGE, President
Benge Associates

Ways and means of determining employee attitudes were carefully studied and agreement reached to engage our firm to conduct a morale survey on their behalf. After considerable research and experimentation, about ten years ago I devised a foolproof method of measuring attitudes.

Our services are based upon the fact that people believe to the extent to which they are permitted to participate. Therefore, the first stipulation was that the employees be told why the survey was being conducted and given every assurance that personalities would not be divulged to management nor would management have access to the ballots or statements. Arrangements were made for ballot boxes which were locked, the keys remaining in the hands of two employee representatives during the balloting and mailed to our Chicago office after these representatives had shipped the boxes to Chicago.

The procedure of measuring morale is simple and effective. We develop an unsigned four-page questionnaire which we call an "opinion ballot" consisting usually of six parts:

(1) An easily understood explanation to the employee as to the objectives of the survey;

(2) A division in which the employee checks the following information: shift, department, sex, age, length of service, and earnings;

(3) Thirty specific questions, ten dealing with attitudes toward the job, ten toward immediate boss, and ten toward the company. The worker marks with a cross the answer that comes closest to telling how he feels.

To illustrate, the employee may be asked to check off one of the following answers to the question:

How does your foreman or department head discipline employees who deserve it?

( ) 1. He bawls them out in front of other employees

( ) 2. He uses sarcasm in front of other employees

( ) 3. He is quite direct, but takes employees aside

( ) 4. He criticizes in private and explains why

( ) 5. His criticisms are always helpful and never given in presence of others

It is evident that an employee who checks response number 5 to the above likes his foreman more than one who checks number 1.

To the thirty specific questions relating to attitudes toward the job, the boss, and the company we usually add another; namely, "Which one of the following in your opinion shows *least* consideration to employees?" Below this question are listed the names of the top executives which, depending upon the size of the company, may be three or four names and in others eight or ten. This question is facetiously called the "unpopularity contest."

4. Approval or disapproval of specific company practices, policies or institutions as:

( ) The cafeteria is satisfactory.

( ) The cafeteria is unsatisfactory

( ) I think our company understands employees and their problems and shows a high regard for their welfare

( ) I think our company does not understand employees and their problems and has little regard for their welfare

5. In order to determine the employee value placed upon certain factors related to employment, a series of from eight to twelve statements are added (see Table 1). This section of the ballot is often referred to as the "barometer" because it indicates to management the trend of employee thinking and evaluation of work values.

6. Even though all questions can be marked with a cross as in any other form of democratic balloting, space is provided for any comment or gripe that the voter may care to register.

When the ballots have been totaled and analyzed, tabulation is greatly facilitated by the use of tabulating equipment. For groups of one hundred or more employees, it is almost imperative to use this mechanical device because of the great amount of cross tabulation.

Summaries are expressed in percentages or "morale scores." Morale itself is not an average. When black and white paint are mixed in equal proportions, the result is a gray color which has fused both extremes. However, if black and white marbles are mixed together, the resulting mass may be gray in color, but identity of either a black or white marble remains. Morale is like the second illustration. Let us, for example, consider a department with 90 employees, five have a very low morale and 85 a very high morale, the resulting morale index would obviously be high, but the five discontented employees would still be there.

A few days after the final report of this study had been presented, the president called another meeting of the staff. He told his men that they now had the opportunity of seeing themselves as the employees saw them.

Convinced that the Factor Vote is a barometer of employee thinking, the president opened his discussion with this section. Contrary to popular belief, it was found that employees ranked job rate third rather than first as had been expected. Over and above job rates the employees valued the security offered by their job, the treatment received from the supervisor and tying with job rate for third spot was how employees feel they are treated by the company.

Further study of the breakdown of the employees' number one factor, Job Security revealed that approximately 72 per cent of the employees expressed themselves as assured that "My job is secure as long as I do my work well," and "Believe my company will do its best to keep me employed." Which the president acknowledged as being very gratifying, and he further pointed out that the feeling of security climbed with years of service. The greater percentage of the sense of security was evidenced among the salaried employees, while hourly workers were some ten per cent lower.

A higher percentage of the salaried employees and more women than men believed their immedate supervisors to be either quite capable or highly qualified. Over three-fourths of the employees were of the opinion that supervisors were either usually or always fair with, of course, certain exceptions in some departments. Approximately the same situation was found in answer to a query as to how well supervisors explained the work to employees. The president discussed frankly the exceptions and set in motion a more thorough investigation of all divisions in which it was evident much dissatisfaction existed. This move was of prime importance because morale or attitudes do not well up from the bottom but rather trickles down from the top. Among the voluntary comments on this aspect of business the president cited the following, "The company is fine in wages, hours, conditions; its one weakness is retention in high position of supervisors of the 'old school' who do *not* have the interests of the worker at heart."

The president expressed some surprise at what the employees thought of the entire company management, emphasizing that while the majority held management in high esteem, attention and thought must be given to the twenty-four per cent who felt that management was either "pretty dumb" or "Has considerable room for improvement."

"I admit," the president said, "some of the expressions of opinion of us (management) are hard to take, but we wanted the facts and now that we have them we must strengthen our weak spots and lay a firm foundation for the construction of a sound, workable, employer-employee relationship. The need for this type of thinking is indicated in the 53 per cent who are of the opinion that co-operation between management and employees is satisfactory. By the time we next make an inventory of our human assets, it is my hope that a larger number will have cause to hold this opinion."

Our client had cause for pride in the vote of its employees on the question of rating the company as a place to work. This rating was above the national average. Ninety-six per cent rated the firm average, or over, as a place to work, when considering all the companies each knew about. When asked to compare the mill with other companies in the community as a place to work, 59 per cent ranked it as either better than most or the best place to work—another 33 per cent rated it as good as the average place to work. Considering the above figures, it is but logical that the response on attitude toward the company as an employer was also above the national average.

While many unrestrained statements were made among the voluntary comments, which were what was being

TABLE 1

26. FACTOR VOTE

Opposite each of the following 12 numbers, please place an "X" under that particular column which shows how much that item means to your happiness in your work. Does each one mean "Very Much," or "Quite a Little," or "Practically Nothing" to you?

	MEANS HOW MUCH TO ME?		
	Very Much	Quite a Little	Practically Nothing
1. My job rate			
2. Job security			
3. How my supervisor treats me			
4. How my company treats me			
5. My opportunities here for advancement			
6. Physical working conditions on my job			
7. Quality of supervision on my job			
8. Being told how well I am doing my job			
9. Extra pay (such as bonuses, incentives, etc.)			
10. Special benefits (insurance, etc.)			
11. Attention given my complaints			
12. Oprortunity to make suggestions			

sought, others were cause to encourage the top management in their efforts. For example, "I have been very happy while working for Blank. My husband and I both work here—we've got out of debt and have bought a home since coming here. What more could you ask for?"

Evidence that Americans do not work "for bread alone," but yet have a pocket-book nerve was found in the fact that rate of pay ranked third in the factor vote. Here in further refining the findings, it was found that the attitudes toward the job, the boss, and company were lowest among hourly rate employees and higher in the salary classifications. This situation, the president indicated, reveals a need to develop our policies around the hourly rate employees in order to bring up the standards. Our firm having made many similar studies is convinced that low rates of pay are not the cancer in industrial human relations which it is credited with; rather wage inequalities cause dissatisfactions. When employees doing the same type of work are paid at different rates the question "why?" arises. It is difficult for employees to understand why one person is paid 67 cents an hour, another working by his side 67¾ cents, and another 68 cents. Each employee wonders why and believes that all of them are doing the same work, and that he works as hard as the others.

The attitude of employees toward the jobs improves with age, the lowest being for employees under twenty, while the group of 60 or over, reached the high of 92 per cent. A like result was found when length of service was considered. In this case, the range was between 67 per cent for employees under one year and a high of 90 per cent for employees with service record of twenty-five years or more. Again this finding was different from the national average which shows attitudes fall below average after the first year and do not begin to climb until about the ninth year. This fact is the basis of a statement I frequently make, "It takes nine years to make an employee."

During recent months, there has been considerable debate over the issue of merit vs. seniority. Morale survey findings indicate that employees in the younger age brackets prefer increases and promotions on a merit basis and that as age goes up so does the desire for seniority privileges. Typical of the conflicting attitudes revealed are the following statements: "I think promotion and pay increases should be mainly determined by individual merit, which means my own performance on the job. That is if it is done in a fair way." . . . "Seniority should be considered."

The entire findings of the survey were studied by departments and divisions. Employees were consulted in some instances. Then a program was determined and all facts pertaining to it were presented to the employees in an attractive, illustrated booklet.

In the booklet, a letter from the president expressed appreciation for the employee co-operation in the study and assured them that their answers were being taken seriously. He also reported that cafeteria remodeling plans, as well as plans for new locker rooms, were being drawn by an architect.

As a result of the survey, the firm's vacation policy was liberalized. Also returning service men were granted vacations on the same basis as if the military had not broken into their company service record.

This case study definitely reveals that a morale survey shows up the weak spots in an employer-employee relationship. It is an inventory of employee attitudes—a good foundation for the building up of a better *esprit de corps* of all employees in a pulp and paper mill.

Canadian Pulp and Paper Industry Producing at All-Time High

PHIL GLANZER

▶▶▶ NEVER BEFORE HAS Canada's pulp and paper industry been so active or so financially healthy.

Contrary to expectations that the industry would have to adjust its production and earnings downward once peace came, 1946 operations show how far wrong those observations were.

Consistently, Canada's largest peacetime manufacturing industry, pulp and paper companies, are now operating close to their effective capacity, and have been since all production controls were removed. Newsprint operations have been stepped up from a 1945 average of 75.8 per cent to a level now exceeding 96 per cent of capacity. At no time during the war did production exceed 78.9 per cent of rated capacity on a yearly basis.

In fact the record of the whole industry to date in this first full year of peace speaks for itself. Even more than in the five years of war, 1946 witnessed a record demand for all types of pulp and paper, a demand which has reflected itself in record levels of operations. Prices have generally been such as to assure a more reasonable return on invested capital than perhaps at any previous time.

Such activity spells high-gear operations for the Canadian economy as a whole. With annual purchases of some two hundred millions of dollars, wage payments of seventy millions, and payments of seventy-five millions to woods workers, pulp and paper operators benefit every section of Canada.

New Record in Exports

As the largest exporter of manufactured goods in Canada, the pulp and paper industry contributes bulk strength to Canadian export trade from which approximately one-third of Canada's national income is derived. Through the first seven months of this year, pulp and paper exports have been making new high dollar marks. In that period the dollar export value totaled two hundred eighteen millions, 17½ per cent of Canada's total export value and up to 26 per cent from the corresponding 1945 period, up nearly 50 per cent from their value for the full year 1939.

Newsprint production to date this year has consistently exceeded 90 per cent of effective capacity; and demands show no immediate signs of abatement. Though shipments to the United States have been at record levels, newsprint stocks in that country are well below normal. For the first time in Canadian pulp and paper history, production this year will likely exceed four million tons.

In wood pulp, operations are also being conducted at record levels, and 1946 exports of Canadian mills are expected to equal, perhaps exceed, the wartime level of 1.5 million tons annually. This would represent a 100 per cent increase from prewar levels

of exports. As in newsprint, the wood pulp demand supply position is still critical and the United States is counting on high Canadian shipments the remainder of the year to keep its position on a basis somewhat approaching an equilibrium.

What is the driving force behind this unprecedented activity in Canada's pulp and paper industry?

Can it be expected to continue? These are the leading questions that pulp and paper observers are asking.

The answer to the first question lies in the simple fact that consumption in the United States of both pulp and paper (particularly newsprint), continues in high gear despite reconversion from war to peace. Canadian pulp and paper operations are geared directly to the level of U. S. requirements for these products. Over 80 per cent of Canada's market pulp is exported to the United States and close to 80 per cent of Canadian newsprint. Whatever serves to stimulate U. S. consumption of pulp and paper immediately finds a direct reflection in the level of Canadian operations.

U. S. Consumption Up

While U. S. Consumption is generally expected to be 25 per cent higher this year than in 1939, supplies from sources other than Canada will be well below previous peacetime levels. In conjunction with rising demands in the United States this has served to create the present tight market in pulp and paper.

Scandinavia formerly exported some 300,000 tons of newsprint annually to the U. S. but has yet to export a ton this year. Add to this the fact that U. S. newsprint production is some 20 per cent below prewar, as capacity has been diverted to other, more profitable, grades of paper and you get the incredients making up the present sellers market in newsprint.

The wood pulp picture is similar to newsprint in that U. S. requirements are at an all-time high. Though Scandinavian countries have been exporting in reasonable volume to the United States, supplies from Northern European countries are still 60 per cent below prewar levels. Scandinavian exports of wood pulp to the United States totaled only 300,000 tons for the first half of 1946 and Canada has been called upon to make up that deficiency plus that part of an increased U. S. consumption that higher domestic production can't meet.

The paper and paperboard industry in the United States has been operating at capacity levels this year. This has translated itself into large and continuing demands for Canadian wood pulp and pulpwood.

How long will the present sellers market in pulp and paper last? How long will present demands continue at peak rates? These questions can't be answered unequivocally. The whole question of when and in what amounts present capacity operations will be slowed down is so closely integrated with such broad economic questions as general business conditions, the possibilities of increasing competition from Scandinavian countries and the threat which new wood pulp capacity holds out to existing Canadian mill operations that any answer would have to be hedged closely by ifs and buts.

This much, however, appears certain, observers agreed. The Canadian pulp and paper industry is now better equipped than ever before to face a decline in the demands for its products, whenever and by whatever amounts that may occur. Here are some significant yardsticks illustrating the financial improvement made by 15 representative pulp and paper companies since 1939:

1) Funded debt at Dec. 31, 1945, 118.4 millions of dollars; down 41 per cent.

2) 1945 net earnings, 37.6 millions; up 90 per cent.

End 1945 working capital, 98.2 millions; up 101 per cent.

3) Holdings of cash, government bonds, etc., end 1945, 42.2 millions; up 23.1 per cent.

Then, too the present situation, particularly in newsprint, is dissimilar to the overcapacity and overcapitalized condition of the industry which characterized its 1920 boom and 1930 bust era. Reorganizations made to company capital structures prior to the war and refunding operations since that time have brought down debt carrying charges to levels within the earning capacity of the companies in most cases, even though operations drop from present levels.

Pulp and paper capacity in Canada has not increased much since 1939. In that year, newsprint capacity was approximately 4.3 million tons. It still remains at that level. Wood pulp capacity, including pulp consumed by paper mills, is now only fractionally higher than in 1939 when groundwood pulp capacity was four million tons, chemical pulp capacity, 2.1 million tons.

But under the stress of historically high demands for wood pulp, certain new capacity projects have been started —some are now in production. These include:

1) Kalamazoo Vegetable Parchment Company, Kalamazoo, Michigan, has brought into production this year at Espanola, Ontario, a bleached sulphate pulp mill, having a capacity of 225 tons per day.

2) Marathon Paper Mills of Canada, Ltd., also has built a mill at Marathon, Ontario, which will mean an additional 300 tons a day to the Canadian bleached sulphate pulp capacity.

3) The Kimberly-Clark Corporation, Neenah, Wisconsin, through its wholly-owned subsidiary, the Long-Lac Pulp and Paper Company Limited, has under construction a complete townsite and a modern chemical pulp mill. This project is located on the north shore of Lake Superior—150 miles northeast of Port Arthur and 250 miles northwest of Sault Ste. Marie. The plant, which it is expected will go into production the latter part of 1948, will produce 300 tons a day of bleached sulphate pulp.

4) A 200-ton kraft mill constructed by Brompton Pulp and Paper Company at Red Rock, Ontario, went into production late in 1945.

5) A four-million dollar kraft pulp mill is planned by Fraser Company, at Athol, New Brunswick. It will have a daily capacity of 120 tons.

Observers justify these additions to capacity on the grounds of expanded acceptance of new industrial products. An important growth factor is the gain made in recent years by paper products against such products as wooden boxes, glass jars, and tin cans in the container field, and lath and plaster in the building trade.

In 1945 the cellulose rayon industry alone consumed 297,000 tons of woodpulp while paper research has developed by-products of potentially large volume. One is lignin, formerly a waste product in wood pulp manufacture but now used to make vanillin, the base for artificial vanilla manufacture. Plastic is another promising non-paper product made by cooking waste liquor with hardwood and forming into sheets under pressure.

In wood pulp some careful observers express the opinion that whatever decline may occur in U. S. consumption will be matched, to some extent, by production declines. They expect that postwar U. S. wood pulp consumption will tend to stabilize at some 10 million tons annually, a level never equaled in prewar and one which might mean an annual import quota of upwards of one million tons of Canadian wood pulp (prewar average about ½ million tons).

U. S. production of wood pulp has been falling steadily below 1945 levels and this declining trend is likely to

(Turn to page 1147)

Machines DON'T Jump Out and Get You!

BEN H. METTERNICH, Manager
Ashland (Wis.) Division, Marathon Corporation

EDITOR'S NOTE: On the shores of Lake Superior, at Ashland, Wisconsin, the Marathon Corporation operates one of the largest paper converting mills in the world. The two paper machines produce better than 28 tons of tissue a day and the converting department turns out over 300 million paper napkins a month. Despite this production record, the Ashland mill with 147 employees has had only two lost-time accidents since the beginning of 1940 . . . one stretch of five years without a single accident. Such a remarkable safety record does not just happen. There is a reason for it. We have asked Ben H. Metternich, who has managed this mill since 1930, to tell our readers how it is done.

▶▶▶ A WORKER MUST APPROACH a machine the wrong way to get hurt. This statement was vividly, though painfully, demonstrated by an incident which became an accident.

An employee was sitting at a printing machine one day. He had nothing to do but to watch the process and stop the machine if something went wrong. Over at one side some gears were running in a bath of oil. Apparently, the worker became fascinated by the working of the gears. He decided to stick his index finger into the oil to learn how deep the gears ran. His finger was caught in the gears and was torn off.

The injured man told his foreman what had happened, but the foreman didn't understand how such a thing could occur and took the man back to the machine to see if he could find out how the accident happened. The worker showed him. He stuck his other index finger in the gears and had it torn off before first aid had been given on the first accident.

This accident happened while I was connected with a paper mill at Menasha (Wis.) before coming to Ashland. It was my first startling revelation of the need for continuous safety education. It was then I decided whatever else I did that safety education was going to be an important part of any job I had to do.

The mill at Ashland was bought by Marathon Corporation in 1927 and it has been operated continuously since that time. It was built in 1910 and much of the machinery now in use dates back to the early operations.

When the company first took over the plant, production was the most pressing problem, and although we tried to operate as safely as we could, we had a total of 103 lost-time accidents in the period between 1930 and 1939—18 accidents during the peak year of 1935.

Our two paper machines are old—one, a fourdrinier, I don't think ever was new. It is a dog from every kennel and has parts from everywhere in it by now. Extreme care in the maintenance and operations of these old machines is most essential if accidents are to be avoided.

When our safety program was instituted in 1939, we laid the job right in the foreman's lap. Weekly safety schools for the foremen were held; sometimes they were held oftener.

Ashland Safety Record from January, 1930, Through August 27, 1946

Safety Record by Department:

	Days
Shipping and Steam	2,656
Finishing	2,518
Paper Mill	2,127
Maintenance	111

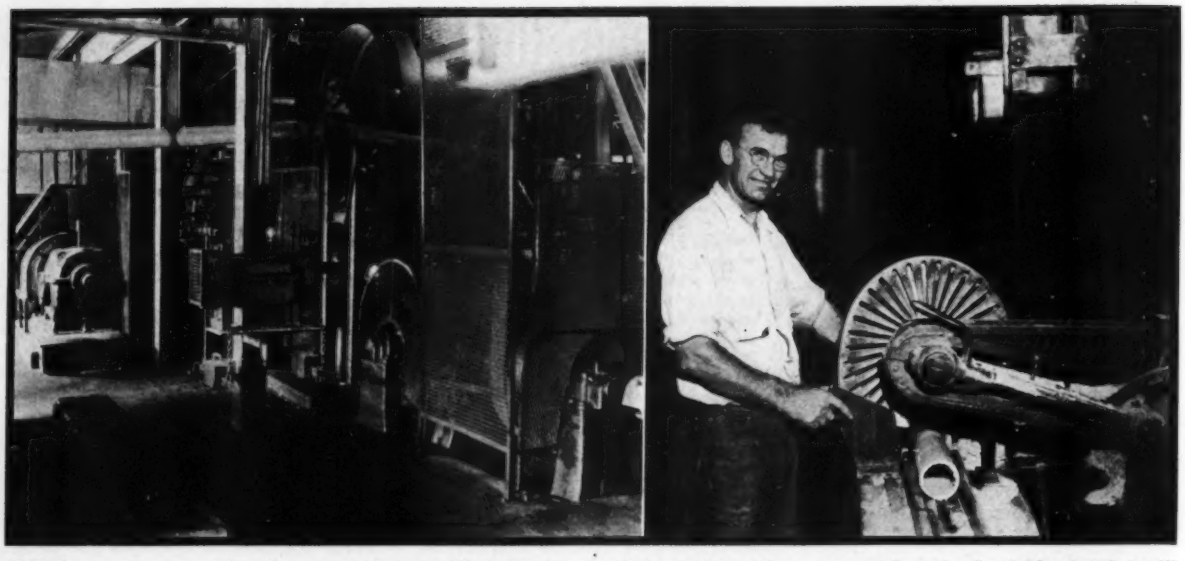
Lost-time Record from 1930 to August 27, 1946:

Years	Number of Lost-time Accidents
1930	5
1931	8
1932	8
1933	10
1934	11
1935	18
1936	11
1937	13
1938	9
1939	10
1940	1
1941	0
1942	0
1943	0
1944	0
1945	0
1946	1

Safety Record without a lost-time accident from October 9, 1940, through May 4, 1946—total 5 years, 6 months, 25 days. Total man-hours for this period, 1,900,212.

Safety Record without a lost-time accident from May 6, 1946, through August 27, 1946—3 months, 21 days. Total man-hours for this period, 97,313.

Shown with the trophies their mill has won as the safest mill in the industry are: Manager Ben H. Metternich (the author, at left) and Assistant Manager George Crowley (right). The awards displayed include the Edward Benton Fritz Memorial Trophy for the "best safety achievement among 177 mills" in 1944-1945, plaques from Employers Mutuals for safety records for 1940 through 1945, and awards from National Safety Council for 1941 through 1945



LEFT—Can you see any place here to get into trouble? These expanded metal guards are everywhere in the Ashland (Wis.) mill of Marathon. Those shown here guard the rear of a paper machine. . . . RIGHT—Here's a core saw you can't get your finger caught in. Guard at the bottom is a Marathon inspiration

We set up a safety committee to make regular plant inspections and dig out danger spots to be corrected.

In this safety program, valuable assistance has been given by the Employers Mutuals, our insurance carrier. Films have been loaned us to enliven our safety meetings; their engineers have contributed valuable suggestions which have been most effective in building interest and enthusiasm, thus keeping our safety committee and foremen on their toes.

At the safety meetings the foremen are shown how to keep men away from danger spots; when they should wear masks, gloves, or goggles; and how to train new workers to realize that to operate a machine safely is just as important as to operate it efficiently.

In the course of a year, many employees take part in the work of our safety committee, which, at the present time, is headed by George Crowley, assistant manager. The committee includes the foremen of each of our six departments and one worker from each department. The workers are changed from month to month so that each has an opportunity to learn first hand how important this safety matter is. Our plant nurse, Mrs. Marie Clark, R. N., is the secretary of the safety committee. Written reports are kept of plant inspections and the records of the safety committee meetings.

The best talker for accident prevention is the man who has had an accident. At this point I should like to pay tribute to Albert Anderson, plant electrician, whose accident recently was the first in more than five years which resulted in lost time. So

LEFT—Sheet iron guards provide protection for the three sets of gears on this Beloit winder. The man at the back with his hand on the guard can't get hurt if the other changes the position of the gears. . . . RIGHT—Albert Anderson won't do this again with the power on. He shows how the accident occurred when an arc burned his hands and face, fused the metal on his goggles

concerned was he when I called on him at the hospital, he begged me to allow him to take that time for his vacation so that it would not count and spoil the record.

Mr. Anderson's accident happened one Sunday. He had work to do on a line switch panel and should have cut off the current for his protection. However, he recalled an accident that had occurred a few years previously when someone came in and started working on a machine, unknown to him, and an accident occurred when the current was turned on unexpectedly. So he worked on a live panel, and while changing the fuse block he bent the bus bar back against the panel and caused an arc that resulted in third degree burns on his hands and face, melted the metal bows and rim guards on the goggles which saved his eyesight.

When accidents occur, it is my policy to invite the man in to talk things over after the injury has healed. We usually begin by talking about factory conditions, his interest in his work—almost anything but the injury. Eventually, he comes out with a candid description of the accident in detail and admits that it probably wouldn't have happened if he had not been careless. It is then suggested that he go out and explain to his fellow employees just how the accident happened and how it might have been prevented.

When a new man joins our organization, the foreman gives him a thorough explanation of the machine and its operation; he is cautioned on certain things that insure safe operation. When he starts to work, he is placed between two older men who keep an eye on him and warn him against carelessness of any kind.

In our organization we feel that safety is the equal responsibility of management, supervisors, and workers. We prefer to have safety ideas originate within our own group and all are encouraged to do their part.

Management leads the way in the promotion of safety. It makes the elimination of hazards and the teaching of safety a part of the foreman's daily routine just as important as turning out a quality product and attaining maximum production.

Canadian Pulp and Paper Industry

(Continued from page 1144)

continue as special measures taken to increase production during the stress of war are removed, it is held. The widespread substitution of paper and paperboard early in the war for such scarce materials as steel, tin, and lumber has meant new and in many cases permanent markets for paper and board, and, therefore, wood pulp.

Where the present position of the Canadian pulp and paper industry differs radically from the boom-expansive era of the latter '20's is that there has been little over-all addition to Canadian production. New pulp mills are now being constructed, particularly in Ontario, but observers do not consider them a threat as long as the total new capacity they represent is such a small part of Canadian pulp and paper capacity. In newsprint, however, there have been no additions to capacity in some years. This is such a stabilizing element that the present boom in newsprint must be set apart from the 1920 boom where new production aggravated the decline in consumption of the 1930's. Then Canadian capacity, under the impetus of active demand and high prices, was built up to a level where collapse was almost inevitable when declining consumption set in.

Chief bottleneck in the way of expanding newsprint capacity in Canada at the present time is the lack of suitable timber reserves. Canada's forests have been depleted at such a rate by high rate of operations and fires, insect damages, etc., that there are relatively few localities left where woodcutting operations could reasonably be conducted.

Then there is the fact that the cost of constructing newsprint mills is such (approximately sixty thousand dollars per ton of daily capacity including limits and working capital) that the capital markets could not, at present levels, finance new capacity. As long as the outstanding securities of existing mills sell at less than replacement costs, as at present, there can be no increase of existing capacity of installation of new capacity, observers say.

Regarding the 1946 outlook for pulp and paper generally, the Combined Working Group of the Combined Raw Materials Board had this to say: "World wide requirements for Northern European supplies of wood pulp and papers, other than newsprint, can in all likelihood be adequately met during the 12-month period following the resumption of shipping from these sources. In the case of newsprint and paperboard, however, sizable deficits are in prospect for this period.

There is still some question as to whether sufficient shipping will be available to move from Northern European sources the quantities of wood pulp and paper that are estimated to be available."

The record has shown how correct these 1945 observations have been. Scandinavian pulp has been coming into the United States, newsprint paper has not. Though this report throws no light on pulp and paper trends beyond 1946, it does at least indicate that newsprint will be perhaps the last pulp and paper item to come into free supply.

Besides making such large contributions to the cause of a free press, the Canadian pulp and paper industry has consistently been the most important peacetime manufacturing industry in Canada.

104 Mills Active

Canada's 104 active pulp and paper mills in 1944 made the following direct contributions to the Canadian economy:

Sixteen millions of dollars for purchased power; twenty-two millions for fuel; nineteen millions for pulpwood bought from farmers and settlers; thirty-five millions for chemicals and mill supplies; annual wage bill of seventy-six millions and paid another seventy-five millions to wood workers; seventy-one millions for transportation.

The pulp and paper industry in Canada is one of the larger contributors to the public purse in Canada. During the war years, the industry paid out in taxes of all kinds an estimated sum exceeding two hundred millions.

Though the immediate outlook for Canada's pulp and paper industry remains good, there are some question marks in the outlook for the industry from a long-range point of view. Biggest liability that the industry operates under at the present time is conceded to be the lack of national forest policy.

A report issued early in 1946 by the Dominion Forest Service indicated that Canada has a total productive forest area of 813,110 square miles, of which 435,000 sq. miles are economically accessible. At the present time, Dr. Cameron, the Dominion Forester, estimates that the annual rate of growth of Canadian forests is 14 cubic feet per acre—about one half the growth rate being achieved in Scandinavian countries. Canada has latent possibilities in its forests, which if realized would mean an industry 3.6 times its present size, it is estimated.

New Law Helps Business Deal with Government Agencies

DONALD L. WILKINS, President
Management Planning of Washington, Inc.

***ABOUT THE AUTHOR:** As president of Management Planning of Washington, Inc., since its inception the author has advised the policy and production executives of more than eighty leading corporations on "how to get things done in Washington." A lawyer and member of the bar of the District of Columbia, he has been carrying on his present activities since 1941. Previously, he was on the staff of the Washington Bureau of Prentice-Hall, Inc. . . . Mr. Wilkins' company assists on problems involving general Washington relations, and renders consultative assistance on other top management problems such as market and opinion research, labor relations policies, and general tax and economic problems.*

▶▶▶ IN THE NEAR FUTURE Government and Business should be finding it much easier to do business with each other than heretofore.

The Administrative Procedure Act, which became effective September 11 promises to remove the major evils in administrative agency procedure which for a generation have caused business men to fume at alleged bureaucracy and red tape, while government agencies, trapped by restrictions or lack of authority, were left to sweat it out.

To those of us who represent business in Washington, the new law, with its sweeping reforms, is of revolutionary significance. To illustrate, here are four features, any one of which would be enough to make the Act sensational:

Uniform Procedure

Under the new law, the hundred-odd administrative agencies, plus the agencies-within-agencies, will operate under a code of uniform procedure. Congress intended that, hereafter, when a business man has dealings with any of the administrative agencies of government, he will not be expected to familiarize himself with special rules set forth by any one agency to govern its own particular law. Heretofore, each agency has been merrily going its own blithe way, a veritable "law unto itself," written by itself, administered by itself, and enforced by itself, within very broad and general legislative delegations of authority. Presumably, after September 11, 1946, the businessman will be able to expect that, instead of an unpredictable "law of its own" being applied to him by his own "problem agency," the agency will administer its particular legislatively delegated powers under the same rules of procedure and of conduct of hearings and issuance of orders as will all other agencies of government. At least, there will be no more Confidential Operating Memorandum which seem, up to now, to have been 100 per cent effective in completely denying assistance to supplicant businessmen.

Full Information

All pertinent information, other than that which is secret and confidential must be made available to the public. Matters of widespread interest, such as agency rules, must be published before they can be applied to your factual situation.

Independent Adjudication

Judicial functions have been separated from prosecuting functions. This particular reform, simple as it sounds, is, in the judgment of administrative practitioners in Washington, one of the principal benefits of the Act. Over a decade ago, when Bureaucracy was figuratively in its "swaddling clothes," earnest consideration to this separation of powers reached a point where legislative correction of the Un-American way of enforcing Bureau policies could be initiated. Led by the American Bar Association, and aided by the Attorney-General and the President, the Administrative Procedure Act started its period of gestation. I think it safe to say that had it not been for the undenied presence of the possibility of the same group of bureaucrats being detectives, arresting officers, prosecuting attorneys, jurors, judge, and warden of the jail, there might never have been the present law. It was simply contrary to the American sense of fair play to permit such a barefaced "stacking of the cards." Possibly a lesson for all of us on the evils of grasping too much of anything.

Bill of Rights

The new law purports to reserve to the public every right not inconsistent with law or administrative efficiency. For example, no matter what your business or activity, if the agency you are dealing with has the power of subpoena, you share that power to an equal degree. So sweeping are the rights and privileges guaranteed to the public by the Administrative Procedure Act that it is commonly referred to as a new "bill of rights."

Here are a few ways in which the Act may benefit you:

If you are an advertising man, your company will not have to actually use a label in order to find out later on whether the Federal Trade Commission will disapprove it. Under the new law, you can ask FTC in advance for a declaratory order.

If you are a financial manager, it is now your prerogative to initiate your own administrative law. You may, for instance, petition the Securities Exchange Commission to issue a new regulation on stock flotations and the law requires SEC to give a prompt decision. If your petition is denied, you are entitled to a statement of the reason for the denial—and you may still appeal to the courts.

If you are in a business which requires federal licenses, such as meat packing, radio broadcasting, or interstate trucking, you are now assured that license applications are to be acted upon promptly, that revocation is not to be attempted except upon notice and with opportunity for the licensee to comply with lawful requirements. Furthermore, subsequent renewals are not to be denied until the reasons therefor are properly decided under the rules governing the issuance of any other order of the agency.

The public information section of the law is of basic importance and this point was emphasized by Representative Francis E. Walter of Pennsylvania, who reported the Act from the Committee on the Judiciary in the House of Representatives. By way of background, Representative Walter gave the following excerpt from the previous report of his Committee on the ill-fated Walter-Logan Bill, the vetoed predecessor of the present law, which illustrated the situation prior to the new law:

"Procedures vary as among the several agencies and to some extent even among the principal officers or employees of the same agencies. It is practically impossible for a member of the Congress, much less an indi-

vidual citizen, to find his way among the many agencies or to locate the particular officer or employee in any of the agencies with whom a particular problem should be discussed with a view toward settlement."

Now all that is remedied. Published rules must tell the who, what, why, when and where of how to get what you want. Furthermore, proposed rules must be published in advance in order to permit interested parties to submit their views about them. If not so published prior to acceptance by the agency they are not applicable to anyone, or perhaps it should be said not effective against anyone.

Specifically, agencies are empowered *and required* to publish organization procedure and other general rules; opinions and orders are to be published or kept open to inspection; and official records to be made available to all properly interested persons.

It has been estimated that the data required to be published as the Act goes into effect would turn the Federal Register into a book of 6,000 pages stacking seventeen inches high, and weighing twenty-four pounds! This monumental printing job is the only presently-foreseen factor which will delay general applicability of the new "Businessman's Bill of Rights."

▶▶▶ The most spectacular reform may well be the separation of judicial functions from prosecuting functions. It was the need for this reform more than ten years ago which prompted the creation of the President's Committee on Administrative Management, whose activities paved the way for the passage of the bill.

At that time the President said that the practice of creating administrative agencies, "who perform administrative work in addition to judicial work, threatens to develop a 'fourth branch' of the Government for which there is no sanction in the Constitution."

To this the Committee added: "There is a conflict of principle involved in their make-up and functions . . . They are vested with duties of administration . . . and at the same time they are given important judicial work . . . The evils resulting from this confusion of principles are insidious and far reaching."

Under the Administrative Procedure Act the judicial function has been separated from the prosecuting function, as well as from any administrative function. This has been accomplished, not by resorting to litigation in outside courts, but by setting up independent hearings commissions within such agency. The new law, therefore, requires in each far-flung administrative agency the same separation of powers as is applied by the Constitution, with its time-tested system of checks and balances between the legislative, the administrative, and the judicial branches, to the business of Government itself.

When the bill was presented to the Senate last March, Senator McCarren described it as "one of the most important measures that has been presented to the Congress of the United States in its history." He called it a "bill of rights for the hundreds of thousands of Americans whose affairs are controlled or regulated in one way or another by agencies of the Federal Government." As he pointed out, it will afford parties affected by administrative powers a means of knowing what their rights are and how they may protect them . . . It provides for the redress of human wrongs and enforcement of human rights."

With our fingers crossed, our patience kept in the forefront, and appreciation of the possible results firmly in mind we can only hope that the administrative agencies, when they apply this Congressional expression of intent, do not overlook the desired goal in an effort to delay complete application of the legislative intent to their own particular agency. Dashing of ingrained attitudes and ideas is always difficult and red tape unwinds slowly. If business is reasonably patient and does not expect the millenium in the next half-hour it will be enjoyably surprised at the additional benefits it will receive, even if only from the assurance of certainty of application of regulatory controls it can have under this law, presently barely-conceived benefits in the elimination of many of today's almost insufferable interferences without apparent rhyme or reason in the manifold operations of today's business.

This counseling of patience with the reversal of attitude of the "sweating" bureaucrats referred to earlier herein need not be avoided because of a fear of possble injury if every conceivable immediate opportunity to argue and procrastinate is not grasped. Congress, even as you and I, realized that the institution of a revolutionary concept of the powers and duties of an administrative agency would take time, and could not be expected to be immediately made 100 per cent effective. Congress, therefore, inserted one little joker of its own in the new law which, in the opinion of most appraisers, pretty effectually guarantees that henceforth no individual citizen, private or corporate, can be "railroaded" by punitive action of any administrative agency. Congress achieved this insurance by the very simple, and yet very basic expedient of in effect saying, "Hereafter no Order, Decision, Rule, Regulation or anything else affecting the business of a person controlled or regulated by an Administrative Agency shall actually effect that person unless it can be conclusively shown, to a Court's satisfaction, that the facts on which the Agency acted are actually true and can be proved on cross examination in open Court, not in the Agency Star Chamber."

Certainly that guarantee, embraced in this law by the simple words, "supported by and in accordance with the reliable, probative, and substantial evidence," should warrant at least patience with the poor bureaucrats whose power was thrown into a "topsy-tuvy" mess almost overnight, it seemed to them, when, on June 11, 1946, the President approved Public Law 404 of the Second Session of the Seventy-Ninth Congress and thereby made those bureaucrats no longer the sole arbiters of what the facts in any case were. From that day forth, any aggrieved person could rest secure in the knowledge that "come hell or high water" he would eventually get a chance to prove his case, and more important, to question the reliability, and even the accuracy, of the agency's heretofore unassailable, and unchallengeable Statements of Findings and Facts, behind which no Court of the land could even venture a timid peek.

Truly, Senator McCarren was not indulging in "campaign oratory" when he described this legislation a "bill of rights" for Americans whose "affairs are controlled or regulated" by "agencies of the Federal Government."

Paper SKETCHES . . . . . .

EXTINGUISHERS MADE OF PAPER, WERE USED IN MEDIÆVAL PRINT SHOPS TO PUT OUT CANDLES.

THE FIRST EXCISE DUTY ON PAPER IN ENGLAND WAS IMPOSED DURING QUEEN ANNE'S REIGN (1711) TO HELP PAY FOR THE WAR BEING WAGED ON THE CONTINENT.

MORE ELECTRICAL ENERGY IS USED IN THE MAKING OF NEWSPRINT BY CERTAIN INDIVIDUAL CANADIAN MILLS THAN MONTREAL AND TORONTO TOGETHER REQUIRE FOR LIGHTING.

THOMAS GILPIN'S CYLINDER PAPER MAKING MACHINE, PATENTED DECEMBER 24, 1816, WAS SAID TO HAVE THE PRODUCTIVE CAPACITY OF 20 PAPER VATS!

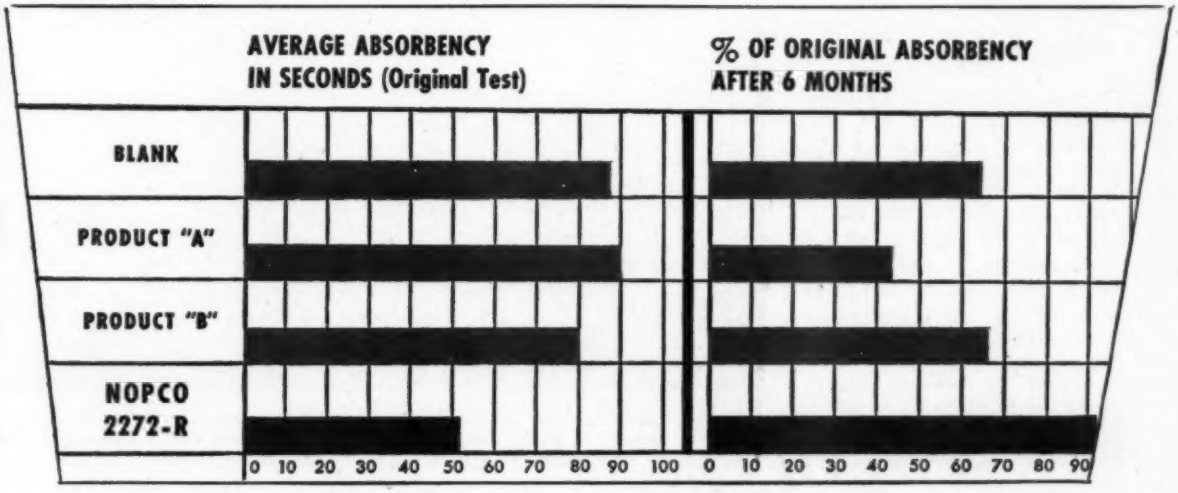
PAPER TOWELS 26% to 48%

MORE ABSORBENT

when you use NOPCO* 2272-R

Here is news of great importance to every manufacturer of paper towels or tissue seeking new and better ways to step up absorbency. Comparative laboratory tests (see chart below) — amply verified by regular mill users — show that NOPCO 2272-R provides faster absorbency than other accepted absorbency materials — as well as longer retention.

NOPCO 2272-R successfully resists the natural tendency of paper to lose absorbency because it "stays with the fibers," thus assuring more lasting absorbency in the *finished sheet.* Manufacturers of specialty papers will also find NOPCO 2272-R particularly helpful because of its compatibility with solutions or dispersions of synthetic resins added to impart wet strength. Economical, too, — depending upon individual mill conditions, only one or two pints of NOPCO 2272-R needed per ton of stock. Write for further details.


AVERAGE ABSORBENCY IN SECONDS (Original Test)
% OF ORIGINAL ABSORBENCY AFTER 6 MONTHS
BLANK
PRODUCT "A"
PRODUCT "B"
NOPCO 2272-R
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90

Report of the 6-Month Test

Sheets treated with three leading absorbency agents, including NOPCO 2272-R, and a separate group of sheets made from untreated stock were used in the tests.

Each product was added in the laboratory beater to stock composed of 300 grams of unbleached spruce sulfite and 200 grams of bleached aspen sulfite pulp dispersed with 12 liters of water. The stock was intentionally beaten to produce a harsh sheet, considerably below normal absorbency. Several hand sheets were made for testing purposes, following standard procedure.

Some sheets from each group were tested immediately for absorbency. Other sheets were tested at regular intervals for six months. Absorbency was measured by recording the time for 1 drop of distilled water to be absorbed completely into the sheet. Greater accuracy was assured, because these tests were the result of *natural* rather than *artificial* aging.

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NOPCO 2272-R

For Higher Absorbency

National Safety Congress

Draws Record Attendance

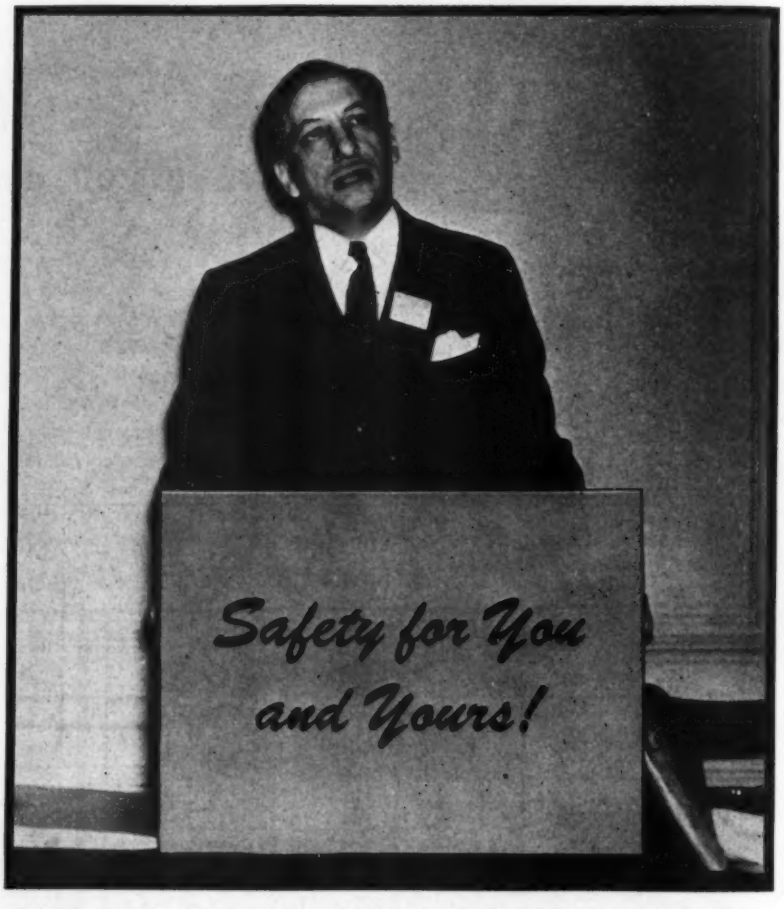
▸▸▸ EIGHT THOUSAND safety engineers and representatives of industry from all parts of the United States set a record attendance at the 34th National Safety Congress and Exposition, which met in Chicago, October 7-11. It was the first peacetime gathering of that organization; no meeting of the Congress was held in 1945.

The Congress headquarters, the exposition, and many of the sectional meetings were again located in the Stevens Hotel, the same as before the war. Some of the sections were located in the Congress Hotel, the Palmer House, and Hamilton Hotel.

At the Annual Council Meeting on the opening day, the president of the National Safety Council, Ned H. Dearborn, sounded a battle cry which rung strong and re-echoed throughout all of the sessions. Mr. Dearborn began his report to the Congress with the declaration that America must become mad—"fighting mad," he put it—at a common enemy. That strong and powerful enemy is called "accident." Mr. Dearborn spoke powerfully and convincingly. He flung startling facts and statistics behind every truism uttered. Listening to his conclusions, one could not help but wonder how the American people, an intelligent, calculating people, can rush heedlessly on, with full consciousness that the death and injury toll among the people in this country is mounting into millions each year.

Reporting on the work of the National Safety Council, its president emphasized the need for more work locally. He said "strong local safety organizations provide the ultimate answer to accident prevention, not only because the national accident problem is the sum of thousands of different local problems, but also because safety is an individual matter and individual human beings are always in some locality."

Mr. Dearborn followed through by stating that a plan for local safety organizations is under advisement. He said "Plans are maturing to effect a national organization of such a kind that accredited local organizations, which for convenience I shall call chapters, are locally the National Safety Council. Relationships are being examined and uniform working agreements are being developed . . . This is another form of united action.



"Is Safety Your Business?" was the subject of the opening address given by Dr. Walter A. Cutter before the Paper and Pulp Section of the Annual Safety Conference. The theme of the Congress—"Safety for You and Yours!"

It is a structural pattern nationally for united action throughout the country, and is essential to the development and conduct of a truly national program. Its lack today is the weakest link in the safety chain. I urge that all safety organizations—their boards, their supporters, and their staffs—dedicate their efforts in the months ahead to the creation of an organizational pattern equitably and uniformly applicable."

Touching on the cost of accident prevention work, Mr. Dearborn stated that industry has contributed $3,000,000 directly to the National Safety Council's public service program in the four years preceding 1946. This is in addition to their own plant programs and advertising . . . Three million dollars spread over a five-year program is important money. But it is a small amount compared with the contributions of business to many other worthy welfare programs.

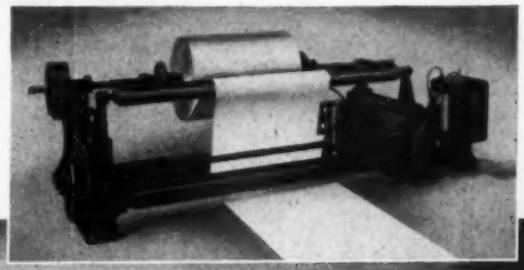
"Business and industry must make a choice. May it be a wise one. They have a direct interest in public accident prevention aside from time-honored public relations. First, production is directly affected by workers killed and injured off the job. Five workers are killed off the job for every three killed on the job. Secondly, the modern progressive business leader knows that what is in the public interest is in the interest of business. And, thirdly, accidents contribute to a loss of customer purchasing power."

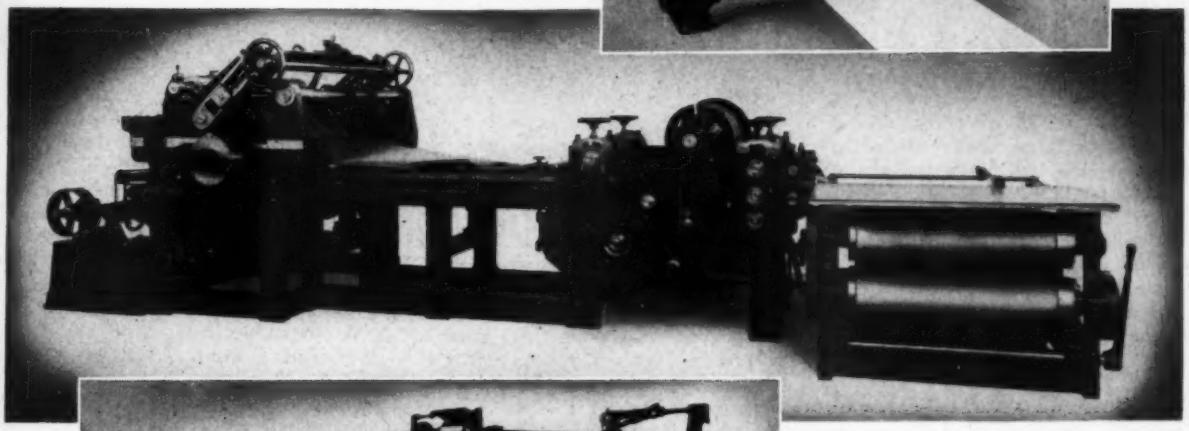
In summing up the activities of the Council for the past year, President Dearborn pointed out the need for expansion within the organization. He said that sections and committees need

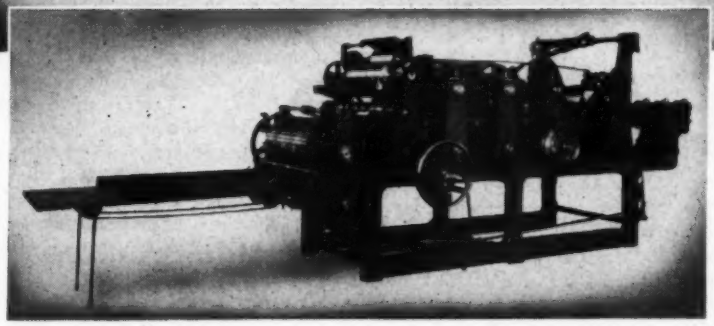
Here's a combination that gives . . .

INCREASED BAG PRODUCTION

LESS PAPER SPOILAGE







TOP

S & W Electric Eye Side Register Control for accurately guiding stock from roll to Tuber.

CENTER

S & W Tuber, for tubes up to 14" wide, 44" long. Side or center seam. Right angle delivery.

BOTTOM

S & W ½ bbl. heavy duty Satchel and Valve Bottomer. Takes tubes up to 28" wide, 60" long.

Smith & Winchester, pioneers in the building of paper bag machinery, have had the experience of many years working with the trade. This close cooperation has resulted in equipment of sound design, extreme rigidity of construction, and many exclusive features for the increased production of high grade bags.

S & W Tubers are designed for pasted or sewed type tubes, of single or multi-wall construction.

S & W Bottomers are built to produce standard satchel and valve bottoms or the combination of the two. Smith & Winchester makes custom-built machines for special requirements.

S

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and
PAPER MILL
MACHINERY

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The SMITH & WINCHESTER *Manufacturing Company*

SOUTH WINDHAM, CONN.

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to be extended in number and sometimes strengthened in character. He also felt the need for simplification. Deep appreciation was expressed for the work done by all members of the staff, but he added "To all engaged in the war on accidents, I say 'good, but not good enough.' "

Prior to the gathering, the theme of the Congress was announced and it appeared on all of the programs and forms used in the various sections. That slogan, a humanitarian plea, should live on, long after the 34th National Safety Congress has gone down in print:

"SAFETY—FOR YOU AND YOURS!"

The Exposition, held in the large exposition hall of the Stevens Hotel, displayed practically all of the devices and equipment that contribute to the safe operation of things mechanical for industry, highway travel, and the home. Safety hints and educational facts filled the literature handed out at many of the 152 booths.

For the ensuing year, Ned H. Dearborn was re-elected president of the National Safety Council.

PAPER AND PULP SECTION

The record registration for the Congress was reflected in the large number of delegates in attendance at the Paper and Pulp Section. Representatives from member mills numbered 184, and a profound interest drew room capacity crowd to listen to the addresses. The Section welcomed many new faces and greeted a number of old-timers in the safety work.

In former years, all awards in the Paper Industry Safety Contest were made at the luncheon meeting which formed a climax to the events of the Section. However, this year an innovation was tried—the trophies and certificates were presented to contest winners at the opening session on Monday afternoon—there was no regular luncheon meeting.

Chairman's Report

At the first meeting of the Section, the general chairman, L. R. Simpson, safety director, Brown Paper Mill Company, Monroe, Louisiana, extended personal greetings to those present and opened the program of the afternoon with an informal report. Following his remarks he asked the committee chairmen who were present to speak extemporaneously, and the responses were warmly received, particularly the report of E. A. Page (Kimberly-Clark Corporation, Neenah, Wis.), vice chairman in charge of membership, when he reported that the membership of the Section had reached 313—an all-time high.

Following the opening ceremonies, Chairman Simpson asked H. P. Heubner (The Flintkote Company, New York), secretary and program committee chairman, to introduce the speaker of the afternoon. Dr. Walter A. Cutter, administrative assistant, New York University, New York City, was the first speaker on the program of the Section. Dr. Cutter delivered a forceful address, which keynoted later proceedings, on the subject "Is Safety Your Business?"

Diligence to the cause of safety, and its objective were outlined by Dr. Cutter comprehensively and with deep feeling. Referring to the safety director and his achievements, Dr. Cutter said: "Men like to be identified with successful undertakings. The success of a safety director may be something quite difficult to measure. Compare him with the production manager, who produces something, and he may look rather unsatisfactory to some. Yet he produces, as tangibly as any production manager, a quality product. In one sense, his success comes about when something *doesn't happen.*" [*The complete text of Dr. Cutter's address is reproduced elsewhere in this issue.*]

The Paper Industry Contest

The report of one committee chairman had been deferred until after Dr. Cutter had given his address. The last half of the afternoon program on Monday had been set apart for the presentation of contest data and awards. Introducing this part of the program, Vice Chairman Heubner called on A. Scott Dowd, chairman of the Contest Committee, to give his report on the 1945-1946 Paper Industry Safety Contest.

Data on the 1945-1946 Paper Industry Safety Contest

Two hundred and twenty-eight contestants, consisting of 182 paper and pulp mills and 46 paper and board manufacturing plants completed twelve months of Safety Competition on June 30, 1946, in the 22nd National Safety Contest of the Paper Industry, sponsored by the National Safety Council.

While the over-all frequency rate of identical contestants was four per cent higher than it was in the previous year, 68 plants showed improvement in their rates. The average frequency rate of all contestants was 19.24; that of paper and pulp mills (Division I) was 19.24; remanufacturing plants (Division II) scored 19.30.

Identical contestants in Division I *raised* their average rate six per cent from that of the previous year, while those in Division II *lowered* their average rate twelve per cent. This experience of each division was quite in reverse of that made in the previous year. Groups B and C (Division I) made reductions of seven and five per cent respectively; Group A (Division II) averaged by identical contestants the highest group reduction in the contest—17 per cent.

Fifty-two contestants, or 23 per cent of the entire enrollment, had frequency rates of less than 10. Twenty-five of these improved their rates of the previous year, or equaled their previous perfect score of no accidents.

There were six perfect scores of no accidents. One of these was in Group C, two were in Group D, and three were in the Remanufacturing Group B. Price Brothers & Company, Ltd., Jonquierre, Quebec, worked the longest number of man-hours without a disabling injury in the Paper and Bag and Pulp Division, and Bird & Son, Inc., Shreveport, Louisiana, made the best showing in the Remanufacturing Division.

A last minute report from the Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec, Canada, results in a revision of that company's previously reported rate of 2.31 to that of 2.98, which places this mill in the position of Rank No. 2 in Group A (Division 1). The Champion Paper & Fibre Company, Hamilton Division, therefore becomes Rank No. 1 in this group, with a recorded rate of 2.86.

The final standing of contestants ranking 1, 2 and 3 in each group are as follows:

DIVISION I—Paper and Pulp Mills

Group A—Mills averaging more than 130 thousand man-hours per month. Enrollment 57; group's average frequency rate, 17.51.

(1) The Champion Paper Fibre Co., Hamilton Division, Ohio; rate, 2.86.

(2) Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec, Canada; rate, 2.98.

(3) Hollingsworth & Whitney Co., Algonquin and Taconnet Mills, Maine; rate, 3.93.

Group B—Mills average 60 to 130 thousand man-hours per month. Enrollment 47; group's average frequency rate, 18.46.

(1) Kimberly-Clark Corp., Niagara Mill, Wisconsin; rate, .66.

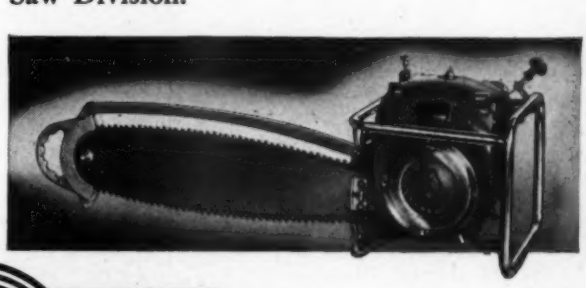
(2) The Flintkote Co., Meridian Mill, Mississippi; rate, .77.

(3) The Champion Paper & Fibre Co., Houston Division, Texas; rate, 3.22.

THE *New* "ALL-PURPOSE" GASOLINE SAWS

The NEW One and Two Man Model No. 1 Timberhog portable chain saw for felling or bucking — powered by an air-cooled, 2 cycle, 4 H.P., built-in gas engine — will do your work 5 times as fast as hand cutting! Long, dependable, trouble-free service is insured by such features as (1) positive fuel injection (engine operates at more than 90 degree angle without adjustment or flooding), (2) automatic centrifugal clutch, (3) antifriction bearings, (4) high tension magnet with reverse flux, single coil, waterproof, adjustable ignition, (5) special heat treated transmission gears — 3 to 1 ratio, (6) positive hand pump oiling to chain, (7) heat treated steel forged connecting rod and crankshaft, hardened and ground, (8) alloy saw steel guide bar, adjustable for chain tension.

The NEW Timberhog is a lighter weight saw because of die cast aluminum or magnesium parts and compact design. MAXIMUM cutting power at weights easily handled. (Two man saw illustrated below). Ideal for timber, construction, railway and general maintenance work. For complete information, address Dept. K, Timber Saw Division.



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Group winners in the annual Paper Industry Contest are presented with National Safety trophies by J. E. Long, past president of the National Safety Council. Left to right: Mr. Long; A. E. Topmiller, safety engineer, Champion Paper and Fibre Co., Hamilton, Ohio; A. M. Koury, personnel director of Champion; Ernest Dutcher, safety engineer, Pioneer Div., The Flintkote Co., Los Angeles, Calif.; C. O. Alexander, safety director, The Flintkote Co., Meridian, Miss.; Paul B. Mcinerney, safety director, Certain-teed Products Corp., Chicago; R. J. Wells, mill manager, Kimberly-Clark Corp., Nigara, Wis.; J. A. LaFerriere, inspector, Price Bros. & Co., Ltd., Jonquierre mill, Quebec; R. T. Hutchinson, safety director, The Flintkote Co., East Rutherford, N. J.; H. B. Goodrich, maintenance and safety engineer, Strathmore Paper Co., W. Springfield, Mass.; Charles Hank, safety engineer, The Flintkote Co., Chicago Heights, Ill.; J. A. Long, superintendent, Bay West Paper Co., Green Bay, Wis.; John W. Guilfoyle, industrial relations manager, Bird & Son, Inc., Chicago

Group C—Mills averaging 30 to 60 thousand man-hours per month. Enrollment 43; group's average frequency rate, 28.55.

(1) Price Bros. & Co., Ltd., Jonquierre, Quebec; rate, .0.

(2) Certain-teed Products Corp., York, Pa.; rate, 4.42.

(3) Certain-teed Products Corp., Niagara Falls, N. Y.; rate, 6.30.

Group D—Mills averaging 6 to 30 thousand man-hours per month. Enrollment 36; group's average frequency rate, 31.24.

(1) E. I. du Pont de Nemours & Co., Inc., Russell, Mass.; rate, .0.

(1) Strathmore Paper Co., Woronoco Mill No. 1, Mass.; rate, .0.

(3) Strathmore Paper Co., Woronoco Mill No. 2, Mass.; rate 2.97.

DIVISION II—Paper and Board Remanufacturing

Group A—Plants averaging 47,500 or more man-hours per month. Enrollment 20; group's average frequency rate, 18.17.

(1) The Flintkote Co., E. Rutherford, N. J.; rate, 2.65.

(2) The Flintkote Co., Chicago Heights, Ill.; rate 2.81.

(3) Container Corp. of America, 35th St. Division, Chicago; rate, 3.57.

Group B—Plants averaging less than 47,500 man-hours per month. Enrollment 26; group's average frequency rate, 22.42.

(1) Bird & Son, Inc., Shreveport Roofing Plant, La.; rate, .0.

(1) The Flintkote Co., Hollywood Paper Box Div., Calif.; rate, .0.

(1) Bay West Paper Co., Green Bay, Wis.; rate, 0.

Fifty-nine contestants have won special Reduction Award Certificates from the National Safety Council, having frequency rates below their respective group averages, and showing reductions by comparison with their rates in the previous Contest.

Three of the contestants whose scores were perfect, have had no accidents in their plants for continuous periods of time up to the close of this Contest. Their records are as follows:

Strathmore Paper Co., Mill No. 1, Woronoco, Mass., Division I, Group D, 9 years and 5 months.

Bay West Paper Co., Green Bay, Wis., Division II, Group B, 9 years and 19 days.

E. I. du Pont de Nemours & Co., Inc., Russell, Mass., Division I, Group D, 3 years and 4 months.

National Safety Council Group Trophies and Certificates

Handsome trophies donated by the National Safety Council are to be awarded to the contestants in each group whose ranks are Number One, including all perfect scores.

Certificates will be awarded to those whose ranks are No. Two and No. Three in each group.

In addition to these awards, are the Certificates of Achievement given by the Council to the 59 contestants that have won Special Reduction Awards.

The 1946-1947 Contest is in its fourth month. No major changes have been made in the rules, and all participants in the last Contest have been enrolled in the present one.

N.S.C. Contest Awards Presented by J. E. Long

Before reading the final part of his report, Mr. Dowd suggested that J. E. Long, past president of the National Safety Council, present the awards given by the Council. For a number of years, Mr. Long has acted for the Council in making these awards, and he is always warmly welcomed. Delegates from the winning mills received from him: (1) the Group trophies; (2) Group certificates; and (3) Achievement Certificates.

Certificate of Achievement

DIVISION I—Paper and Pulp Mills

Group A

Brown Corp., La Tuque (Que.), Can.
Kimberly-Clark Corp. (Lakeview Mill), Neenah, Wis.
Kimberly-Clark Corp., Kimberly, Wis.
Crown Zellerbach Corp. (Crown Willamette Paper Co. Div.), Camas, Wash.
International Paper Co., Niagara Falls, N. Y.
Container Corp. of America, Philadelphia, Pa.
The Brown Paper Mill Co., Inc., Monroe, La.
Marathon Corp., Menasha, Wis.
Bathurst Power & Paper Co., Ltd., Bathurst (N.B), Can.
North Carolina Pulp Co., Plymouth, N. C.
Masonite Corp., Laurel, Miss.

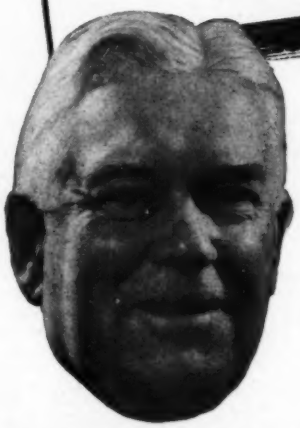
Group B

United States Gysum Co. (Insulation Plant), Greenville, Miss.
Price Brothers & Co., Ltd., Riverbend (Que.), Can.
Brunswick Pulp & Paper Co., Brunswick, Ga.
Combined Locks Paper Co., Combined Locks, Wis.
Ontario-Minnesota Pulp & Paper Co., Ltd., Kenora (Ont.) Can.
Fraser Paper, Ltd., Madawaska, Maine.
West Virginia Pulp & Paper Co., Tyrone, Pa.
The Mead Corp. (Dill & Collins Div.), Philadelphia, Pa.
Neenah Paper Co., Neenah, Wis.
Bemis Brothers Bag Co., Peoria, Ill.
Ontario-Minnesota Pulp & Paper Co., Ltd., Fort Frances (Ont.), Can.
Thilmany Pulp & Paper Co. (Upper Mill), Kaukauna, Wis.

Group C

Certain-teed Products Corp., East St. Louis, Ill.
Crystal Tissue Co., Middletown, Ohio.

They use PERMUTIT* *Water Treatment* for 2 different reasons!



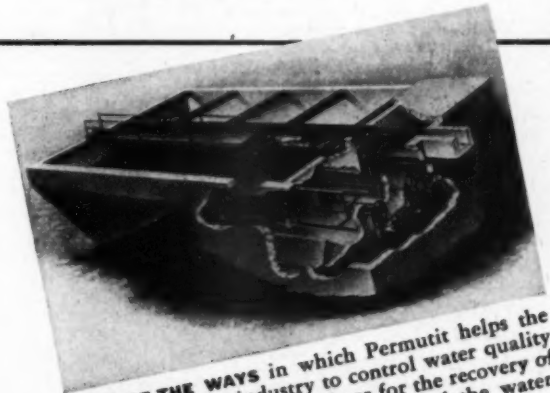
1. *"We were wasting pulp fibre*—far more than was practical. A Permutit White Water Reclaimer was installed at the mill and this equipment certainly did the trick. Today we're not only recovering a high percentage of fibre and filler from our process water, but we even re-use the water!"

2. *"A water shortage sold me* on Permutit. It looked as though the mill would have to shut down, until one of our chemists suggested Permutit equipment for *water* recovery. Water shortage doesn't bother us now. We use the same water over and over now, without loss of efficiency."

WHERE DO YOU FIT IN? Which of these mill operators reminds you of — *you?* If your water problem is one or a combination of these, there is help for you here at Water Conditioning Headquarters.

Permutit invites you to take advantage of its knowledge of paper mill water, born of more than thirty years' experience in the field of water treatment. Write for information to The Permutit Company, Dept. PI-11, 330 West 42nd Street, New York 18, N. Y., or Permutit Co. of Canada, Ltd., Montreal.

*Trademark Reg. U. S. Pat. Off.



ONE OF THE WAYS in which Permutit helps the pulp and paper industry to control water quality is this White Water Reclaimer for the recovery of fibre and filler, permitting re-use of the water.

PERMUTIT

WATER CONDITIONING HEADQUARTERS

International Paper Co. (Southern Kraft Div.), Mobile, Ala.
Container Corp. of America, Circleville, Ohio.
Certain-teed Products Corp., Savannah, Ga.
Certain-teed Products Corp., Richmond, Calif.
Eddy Paper Corp., White Pigeon, Mich.
Rising Paper Co., Housatonic, Mass.
Rogers Corp., Goodyear, Conn.
Certain-teed Products Corp., Marseilles, Ill.
American Writing Paper Corp. (Linden Div.), Holyoke, Mass.
Strathmore Paper Co., West Springfield, Mass.
Whiting Plover Paper Co., Stevens Point, Wis.
Esleeck Mfg. Co., Turners Falls, Mass.
Bird & Son, Inc., Phillipsdale, R. I.
Lee Paper Co., Vicksburg, Mich.

Group D

Mead Corp., Nashville, Tenn.
Ward Paper Co., Merrill, Wis.
Certain-teed Products Corp., Kansas City, Mo.
United States Gypsum Co., North Kansas City, Mo.
Latex Fiber Industries, Inc., Beaver Falls, N. Y.
Certain-teed Products Corp., Buffalo, N. Y.
Central Fibre Products Co., Inc., Tama, Iowa.
International Paper Co., Riley, Maine.
American Writing Paper Corp. (Mt. Tom Div.), Holyoke, Mass.
United States Gypsum Co., Oakmont, Pa.

DIVISION II—Paper and Board Remanufacturing

Group A

Gaylord Container Corp. (11th Street Plant), St. Louis, Mo.
Marathon Corp., Wausau, Wis.
Paper Package Co., Indianapolis, Ind.

Group B

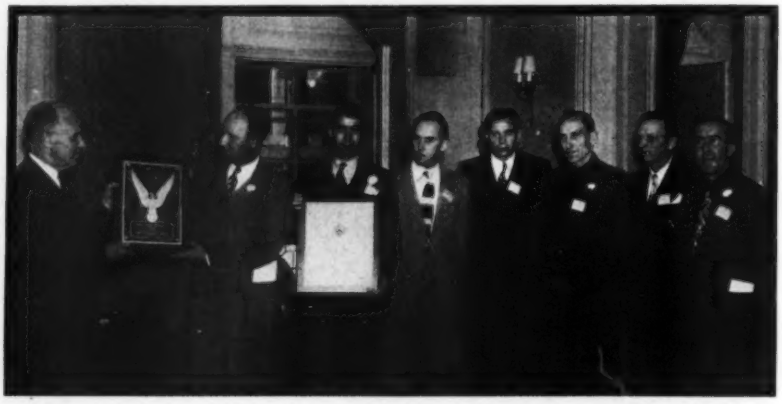
Fort Wayne Corrugated Paper Co., Rochester, N. Y.
Fort Wayne Corrugated Paper Co., Chicago, Ill.
Bird & Son, Inc., Chicago, Ill.
International Cellucotton Products Co., Memphis, Tenn.
Fort Wayne Corrugated Paper Co., Hartford City, Ind.
Fort Wayne Corrugated Paper Co., McKees Rocks, Pa.
Container Corporation of America, Baltimore, Md.

Following the trophy and certificate awards, Mr. Dowd read the final, and climaxing part, of his report—the announcement of the major prize winner.

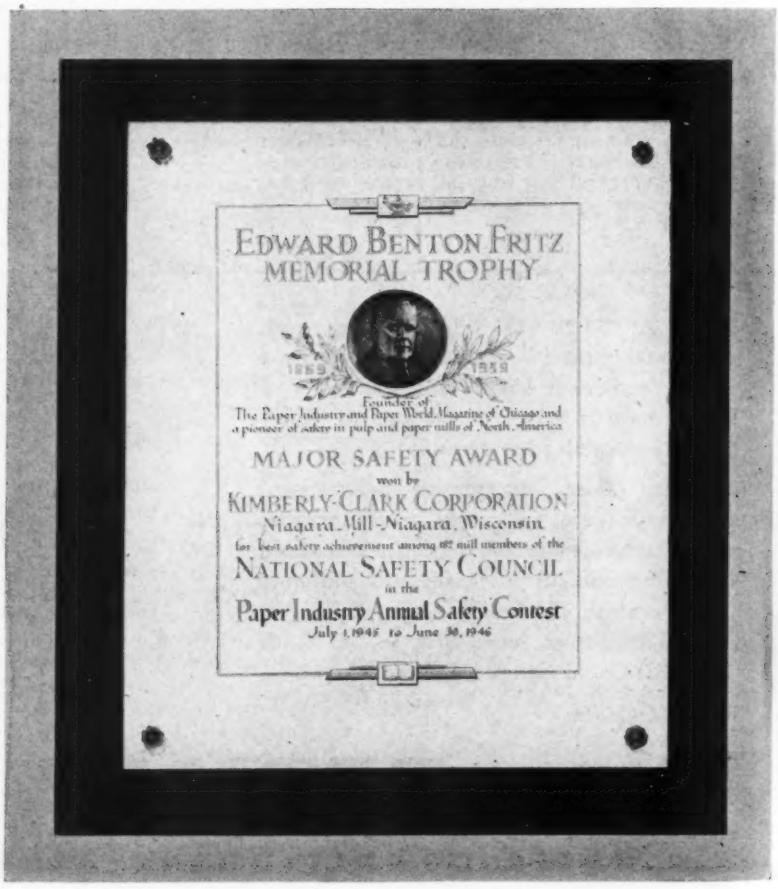
Edward Benton Fritz Memorial Trophy

The winner of the Edward Benton Fritz Memorial Trophy, donated by Fritz Publications, Inc., Chicago, publisher of THE PAPER INDUSTRY AND PAPER WORLD, is the contestant which by a majority vote of five judges, named in the Rules, has in their opinion made the best safety achievement among the paper and pulp mill participants in the Contest, based upon frequency, man-hours worked, physical conditions, and other contributing factors.

The winner of this Grand Prize in the 1945-1946 Contest is the Niagara Mill of Kimberly-Clark Corporation,



Seven representatives of Kimberly-Clark's Niagara (Wis.) mill attended the Safety Congress. They are shown here with J. E. Long, past president of the National Safety Council, who awarded the Group trophies. Left to right: Mr. Long; R. J. Wells, mill manager; E. T. O'Donnell, safety man; T. H. Howe, Andrew Hill, Elmer Farmer, and Axel Kjell, safety committee members; and C. E. Murray, personnel superintendent. The K-C Niagara mill won the NSC trophy in Group A, also the Grand Prize, the Edward Benton Fritz Memorial Trophy (below)


EDWARD BENTON FRITZ
MEMORIAL TROPHY
1855 1933
Founder of
The Paper Industry and Paper World Magazine of Chicago and
a pioneer of safety in pulp and paper mills of North America
MAJOR SAFETY AWARD
won by
KIMBERLY-CLARK CORPORATION
Niagara Mill - Niagara, Wisconsin
for best safety achievement among 182 mill members of the
NATIONAL SAFETY COUNCIL
in the
Paper Industry Annual Safety Contest
July 1, 1945 to June 30, 1946

How DURCO Solves your CORROSION PROBLEMS . . .

For	Use
Alum	DURIRON Dissolving Jets, Pipe, Pumps, Tank Outlets
Black Liquor Recovery System	DURIMET Valves, Pumps
Bleach	DURICHLOR Pipe, Pumps, Valves
Caustic Soda	DURIMET, Pure Nickel, Ni-Resist Pumps, Valves
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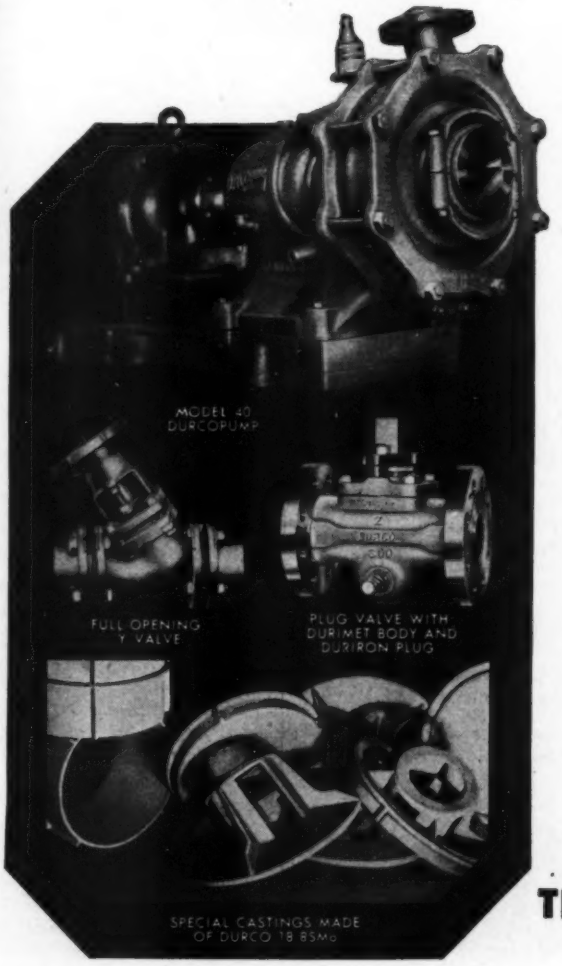
Sulfurous Acid	DURIMET Pumps, Valves
Panzl Strainers	DURIMET

Durco equipment and castings made of Durco corrosion-resisting alloys provide the answer to practically any corrosion problem.


MODEL 40 DURCOPUMP
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PLUG VALVE WITH DURIMET BODY AND DURIRON PLUG
SPECIAL CASTINGS MADE OF DURCO 18-8Mo

The Durco alloys which assure permanent resistance in a variety of corrosive services include:

DURIRON, DURICHLOR } High Silicon Irons

DURIMET — A low carbon stainless steel

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Here's a look at some of the Durco equipment available in these alloys.

DURCOPUMPS with wet end parts made of either Duriron, Durichlor or Durimet. Built in sizes from 1½" suction, 1" discharge to 6" suction, 6" discharge; capacities up to 2000 gpm. Ask for Bulletins 810-D and 811-C.

DURCO VALVES—24 types in many sizes. Durco plug valves are furnished in Duriron, Durichlor, Durimet and other corrosion-resisting alloys. The combination of Duriron or Durichlor plugs with Durimet bodies makes a particularly popular type of valve. Send for Valve Catalog 605-2.

PIPE AND FITTINGS made of Duriron or Durichlor in two types, split-flanged pipe for most industrial purposes and bell and spigot for waste lines. Sizes 1½" to 8"; larger sizes made to order.

SPECIAL CASTINGS—Special castings are made in any alloy to your own or our design. Use our Engineering Service.

DURCO Adv. 21-GM

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

THE DURIRON COMPANY, INC.
DAYTON 1, OHIO

Niagara, Wisconsin, which tops the list in Group D with a frequency rate of .66.

The Niagara Mill of Kimberly-Clark Corporation, which employs between six and seven hundred people, manufactures groundwood pulp, sulphite pulp, and book paper. Its safety movement began in 1910. Safety efforts are based on the company's "Five Factors Common to Good Safety Programs," which are: (1) Teach employees the safe way; (2) Hold supervisors responsible (top management is 100 per cent behind the safety program); (3) Enforce the few well chosen safety rules; (4) Inspect departments regularly (each department has its safety committee and other affiliated committees, controlled by a general mill committee); (5) Stimulate interest (many devices are used to instill safety consciousness and a desire to work safely among the employees).

While this mill has never until this date won a major safety award in the National Contest, it has had a consistently low frequency rate and has gradually bettered its standing in the Contest each year since 1939. An outstanding no-injury record was made this year when the mill worked from April 27, 1945, to June 4, 1946—402 consecutive days, or a total of 1,711,514 man-hours, without a lost-time accident.

As a pioneer of safety in the paper and pulp mills of North America, Edward B. Fritz had personally awarded his major trophy to winners in these annual safety contests of our industry. Since his death in 1939, it has been our pleasure to welcome Mrs. Fritz, vice president and treasurer of Fritz Publications, in her presentation of the award. She has always given us an inspiring and encouraging message, and it becomes my pleasure again to present Mrs. Fritz and to ask her to present the Grand Prize.

Mrs. Fritz Presents the Major Award

Mrs. Fritz expressed her delight in meeting with the Section after a lapse of two years. She praised the splendid record made by all of the participants in the Contest, and said this proved they were making real progress in the work of organized accident prevention. She felt it also indicated that all who were connected with the Contest were working toward one common goal—the time when all workers are well trained in the principles of safety and practically every mechanical hazard that can possibly be controlled is guarded against accident.

R. J. Wells, mill manager of Kimberly-Clark Corporation's Niagara (Wis.) mill, receives from Mrs. Fritz the Grand Prize in the Paper Industry Safety Contest—the Edward Benton Fritz Memorial Trophy

Mrs. Fritz spoke touchingly of the readjustment problems being experienced by many returned service men and the need for understanding and tolerance on the part of all who supervise them. She then presented to R. J. Wells, mill manager of Kimberly-Clark Corporation's Niagara (Wis.) mill, the Edward Benton Fritz Memorial Trophy.

Mr. Wells told the Section that the award of the major trophy would mean a great deal to his mill and the entire company, since it was the first time the Niagara mill had won the major safety award.

TWO SESSIONS HELD ON TUESDAY AFTERNOON

For the past several years it has been the practice to hold two sessions, simultaneously—one session with the loggers, taking up operations in the woods; the other, paper and paper products session. These meetings were held on the second afternoon of the Congress.

Pulpwood Loggers Group

A capacity attendance marked the meeting of the Loggers Group, which was presided over by J. E. Cantin, safety director, Quebec North Shore Paper Company, Baie Comeau, P.Q., Canada.

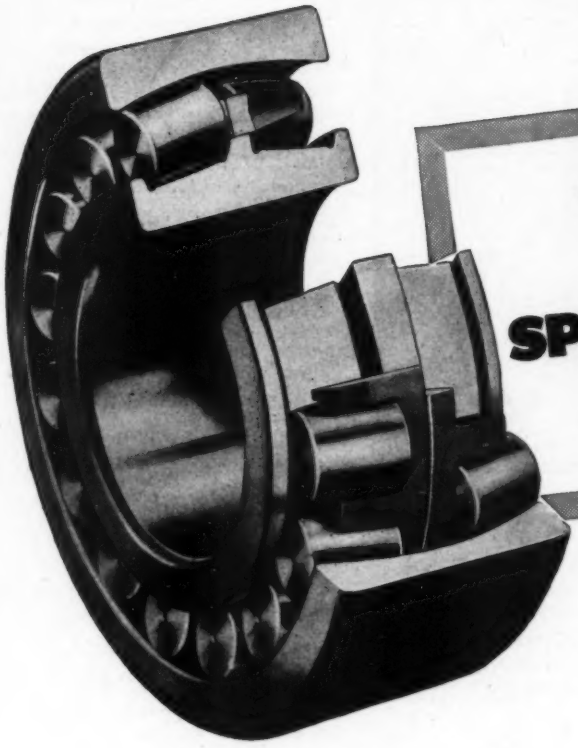
A very comprehensive account of fire control methods as practiced in the forests of the South was given by the first speaker, Arthur Nelson, chief forester, the Flintkote Company, Meridian, Mississippi. Mr. Nelson's subject was "Fire Control in Pulpwood Logging Operations." He said that flying and two-way radio have made the job of fighting forest fires a lot easier in recent years. The airplane, first used in Canada in 1919 to detect and investigate forest fires, now makes possible doing a job in 30 minutes which formerly required at least two hours. The speaker explained that by means of two-way radio, more effective use can be made of fire fighting units.

In closing, Mr. Nelson urged personal contact with people living in forest areas to teach them the need for care as a big factor in keeping "pulpwood growing instead of burning."

The second speaker at this session was Dr. D. C. Eisele, chief physician and surgeon, Kimberly-Clark Corporation, Ironwood, Michigan, who spoke on the subject "First Aid in the Woods."

Dr. Eisele said that veterans discharged from the medical corps of the Armed Forces who like lots of fresh air should go to the north woods. He then urged the logging operators to utilize such men in setting up accident prevention and first aid programs.

The speaker compared isolated logging operations in the woods to a battlefield since an injured worker is far from hospital care and first aid is an important factor in reducing the toll from logging accidents. Dr. Eisele contrasted woods operations and al-



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SELF-ALIGNING
SPHERICAL ROLLER BEARING

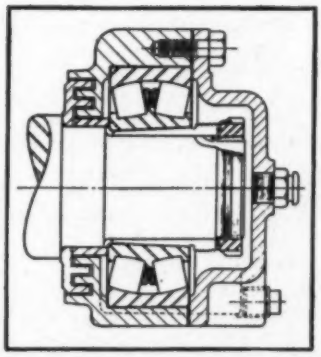
...for heavy-duty applications

In paper stock preparation equipment such as Beaters, Jordans and Chippers as well as in a large number of Paper Machine applications — wire and press rolls, press and dryer felt rolls and calenders — Torrington Self-Aligning Spherical Roller Bearings will handle radial or combined radial and thrust loads efficiently and with a minimum of maintenance attention.

Features of the Torrington Spherical Roller Bearing include self-alignment under all loads and conditions of shaft deflection or frame distortion . . . high radial capacity . . . high two-directional thrust capacity . . . and unit construction for easy assembly. Dependability is built in through the skilled craftsmanship of Torrington's Bantam Bearings Division, which has specialized for years in the design and manufacture of custom built bearings.

Our engineering staff will be glad to place this experience at your disposal with practical suggestions for the application of the Spherical Roller Bearing to the equipment you design, build or use. For further information contact your nearest Torrington Representative or write for our Bulletin No. 200.

THE TORRINGTON COMPANY • BANTAM BEARINGS DIVISION
SOUTH BEND 21, INDIANA



This cross-section shows a taper bore Torrington Self-Aligning Spherical Roller Bearing as applied to a paper mill press roll. The bearing is mounted on the shouldered shaft by the use of a removable sleeve. Internal running clearance is controlled by the amount of expansion given the inner race, assuring proper load distribution under all conditions.

TORRINGTON BEARINGS

SPHERICAL ROLLER • STRAIGHT ROLLER • TAPERED ROLLER • NEEDLE • BALL

most any other industrial activity carried on in an urban center where care for accident victims is close at hand. He said that setting up first aid programs in the woods "will save more than the cost by decreasing time lost through accidents and disability, and will make for more efficient production."

Another point brought out by Dr. Eisele was that this work should be made more attractive to the youth of the country. In the past, this work has been done mostly by older men, whose recovery from accidental injury is more prolonged than with younger men.

Paper Products Session

Two stirring addresses were given before the Paper Products Session. The interest in this popular meeting was evidenced by the large attendance which overflowed the room where the meeting was held. Presiding at this session was G. J. Bienvenu, superintendent, Gaylord Container Corporation, Bogalusa, Louisiana.

The first speaker was John W. Meinhardt, director of safety, Gaylord Container Corporation, St. Louis, who spoke on "Safety in Relation to Other Management Functions." Mr. Meinhardt said that labor turnover, always a bugaboo, today is charged with another villainous characteristic, since records in recent years show a marked parallel between high labor turnover and high accident frequency rates. The speaker deplored the tendency in some management quarters to merely tack on a safety program to plant operation policies. "An accident program to be fully successful," he declared, "must be built in, not tacked on, to the entire run of management functions." He used a number of charts, which were illustrated from slides as he spoke. [*Mr. Meinhardt's complete address, with illustrations of the charts, will be found elsewhere in this issue.*]

"Accident Prevention through Improved Operational Methods," was the subject of the second address given before this session by Gustave F. Williams, assistant regional manager, Loss Prevention Department, Liberty Mutual Insurance Company, Atlanta, Georgia.

Dinner-Business Meeting

Seventy-two safety men from mills and paper products plants in twenty-one states and Canada attended the Section's dinner on Tuesday evening. Through the years, this feature has become a popular part of the Congress program. In jocular spirit of fellowship, stories are swapped and

E. A. Page, newly elected general chairman of the Paper and Pulp Section

questions discussed freely. Out of it all comes the feeling that one man from Massachusetts thinks he has gotten something really worth while from a safety director in Ohio—or from a plant superintendent in the Deep South.

At the dinner this year, E. A. Page, safety engineer, Kimberly-Clark Corporation (Neenah, Wis.), who presided, put up for discussion the sixty-four dollar question. Referring to the annual safety contest, in which the participating mills and plants are governed by different compensation laws and regulations of the various jurisdictions where they are located, *information was wanted as to what could be an equal and fair method for the contest in determining a lost-time accident.*

It was pointed out that the rules of the contest adhere to the classification of industrial injuries as covered in the Revised Code Z 16.1 (1945) of the American Standards Association. In this, under title of "Doubtful Cases" (Par. 3.7), it is stated: "In case of doubt as to the degree of disability, the classification of an industrial injury shall be based on the decision of the physician engaged by, or authorized by the employer to treat the injury."

In states where the law permits an injured workman to select his own physician, and the decision of the latter is the determining factor, the situation is quite different from that as provided by the Code.

A healthy discussion of the question resulted in the request that the Contest Committee make a study of the matter and bring it before the next meeting of the Executive Committee, with possibly a recommendation.

New Officers

The following officers of the Paper and Pulp Section were elected for the year 1946-1947:

General Chairman—E. A. Page, Kimberly-Clark Corp., Neenah, Wis.

Vice Chairman in Charge of Membership—H. P. Heubner, The Flintkote Co., New York, N. Y.

Secretary—R. W. Croucher, M & O Paper Co., International Falls, Minn.

News Letter Editor—George Harper, The Mead Corp., Chillicothe, Ohio.

Program Committee—R. W. Croucher (Chairman), M & O Paper Co., International Falls, Minn.; Julius A. Draper, Consolidated Paper Corp., Ltd., Grand'Mere, P.Q., Can.; W. G. Etter, River Raisin Paper Co., Monroe, Mich.; Reinold Ganzer, Marathon Corp., Rothschild, Wis.; L. C. Smith,

The dinner meeting of the Paper and Pulp Section was a pleasant, get-together occasion. New officers were inducted. Seated at the speakers table were (L to R): George W. Harper, editor "News Letter"; J. Fred Berry, past general chairman and member of Program Committee; R. W. Croucher, secretary; E. A. Page, general chairman; L. R. Simpson, retiring general chairman; H. P. Heubner, vice chairman in charge of membership; H. B. Goodrich, chairman Safety Instruction Card Committee; and A. Scott Dowd, chairman of Contest Committee

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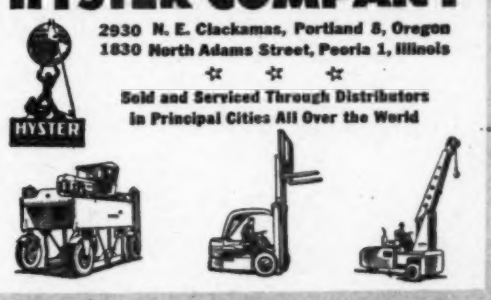

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Thilmany Pulp and Paper Co., Kaukauna, Wis.; J. Fred Berry, Alton Box Board Co., Alton, Ill.

Contest Committee—A. Scott Dowd (Chairman), Fritz Publications, Inc., Chicago; W. R. Cahill, Nekoosa-Edwards Paper Co., Port Edwards, Wis.; B. D. Rogers, Bird & Son, Inc., East Walpole, Mass.

Data Sheet Committee—C. J. Munk (Chairman), Racquette River Paper Co., Potsdam, N. Y.; Cyril B. McCan, Crossett Paper Mills, Crosset, Ark.; George S. Nelson, Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis.; Don Severson, Neenah Paper Co., Neenah, Wis.; A. J. Basile, The Lawrence Paper Co., Lawrence, Kans.; H. H. Yoder, Golf States Paper Corp., Tuscaloosa, Ala.

Engineering-Safe Practice Committee—J. A. Long (Chairman), Bay West Paper Co., Green Bay, Wis.; E. G. Amos, American Paper & Pulp Ass'n, New York, N. Y.; M. W. Dundore, Beloit Iron Works, Beloit, Wis.; E. C. Jacobs, American Mutual Liability Insurance Co., New York, N. Y.; G. R. Merriman, International Paper Co., Mobile, Ala.; G. E. Mortenson, Kimberly-Clark Corp., Neenah, Wis.

Health Committee—Dr. James D. Stark (Chairman), Hammermill Paper Co., Erie, Pa.; Dr. Paul A. Brehm, State Board of Health, Madison, Wis.; Dr. Lewis H. Frechtling, Champion Paper & Fibre Co., Hamilton, Ohio; J. A. Moore, Paterson-Parchment-Paper Co., Bristol, Pa.

Safety Instruction Card Committee—H. B. Goodrich (Chairman), Strathmore Paper Co., West Springfield, Mass.; A. S. Cook, Quebec Pulp & Paper Safety Ass'n, Quebec, Can.; C. L. R. Dougherty, Union Bag & Paper Corp., Savannah, Ga.; G. C. Kerr, Quebec North Shore Paper Co., Baie Comeau, P.W., Can.; B. J. McCloskey, Hoberg Paper Mills, Green Bay, Wis.; George H. Pearce, Bathurst Power & Paper Co., Bathurst, N.B., Can.

Statistics Committee Chairman—Fred W. Braun, Employers Mutual, Wausau, Wis.

Visual Education Committee—Thomas D. Young (Chairman), The Ohio Box Board Co., Rittman, Ohio; George Gibb, Canadian International Paper Co., Gatineau, P.Q., Can.; C. A. Howard, West Virginia Pulp & Paper Co., North Charleston, S. C.; Karl Kiedaisch, Iowa Fiber & Associated Box Co., Keokuk, Iowa; J. R. Latter, Anglo-Canadian Pulp & Paper Mills, Ltd., P.Q., Can.; Clifford D. Schaeffer, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.

Logging Operations Representative—James A. McGivney, Brown Co., Berlin, N. H.

Paper Products Plants Representative—H. H. Aderhold, Marathon Corp., Menasha, Wis.

Analyzing Accidents

The closing session was held Thursday afternoon, H. P. Huebner, vice chairman of the Section presiding. The program began with a brief Review of the 1945-1946 Paper and Pulp Accident Experience, by F. W. Braun, vice president and chief engineer of the Employers Mutuals, Wausau, Wisconsin, and chairman of the Section's Statistics Committee.

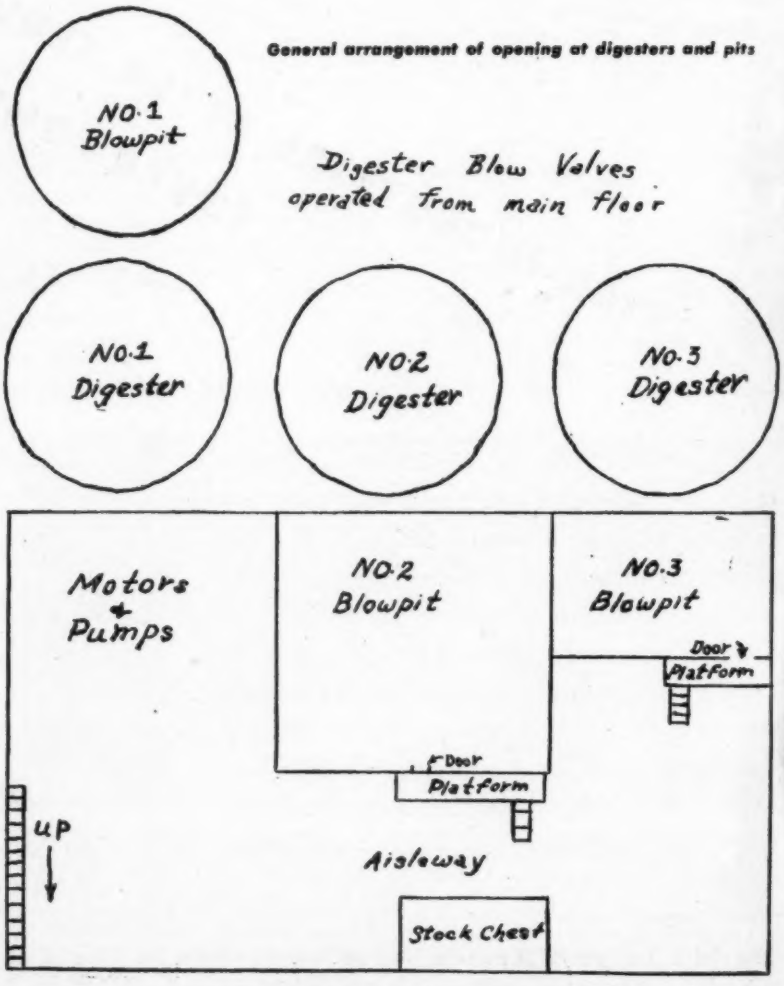
The frequency rate of 345 units reporting in the paper and pulp industry during 1945 was 20.52. This was three per cent lower than the rate in 1944. The industry ranked 30th among all reporting industries, the average frequency rate of which was 13.62. The severity rate for the industry was 1.42, which was 25th in rank of all reporting industries.

Mr. Braun set a frequency rate goal for the industry at 10 or lower, and urged that all members of the Section turn in their accident reports.

A Review of the 1945-1946 Paper and Pulp Accident Experience was presented by F. W. Braun, vice president and chief engineer, The Employers Mutuals

The feature of the program was

General arrangement of opening at digesters and pits



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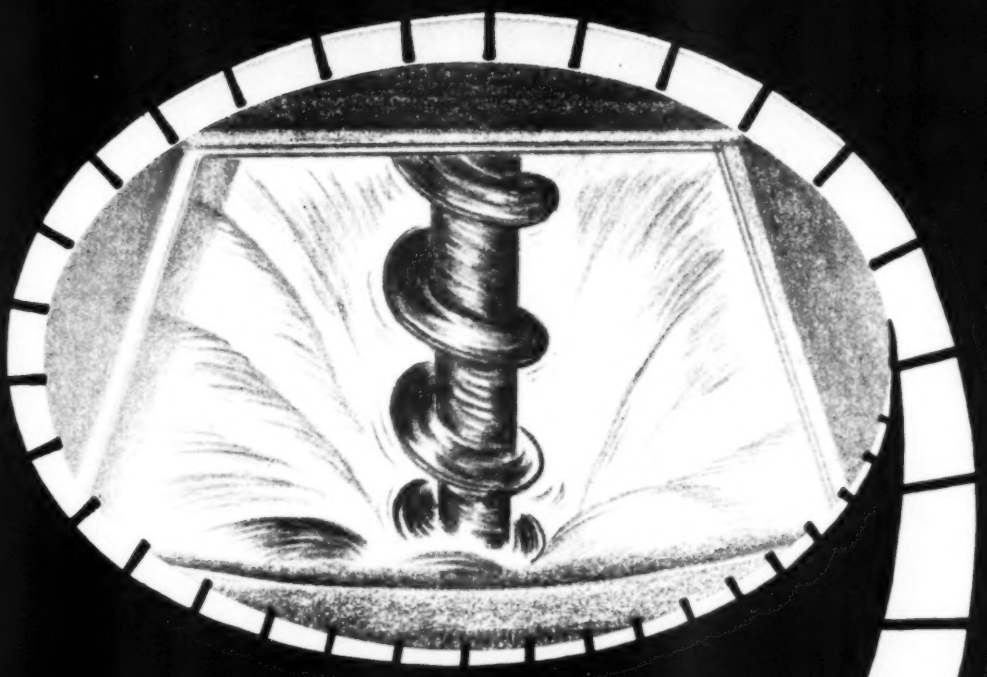
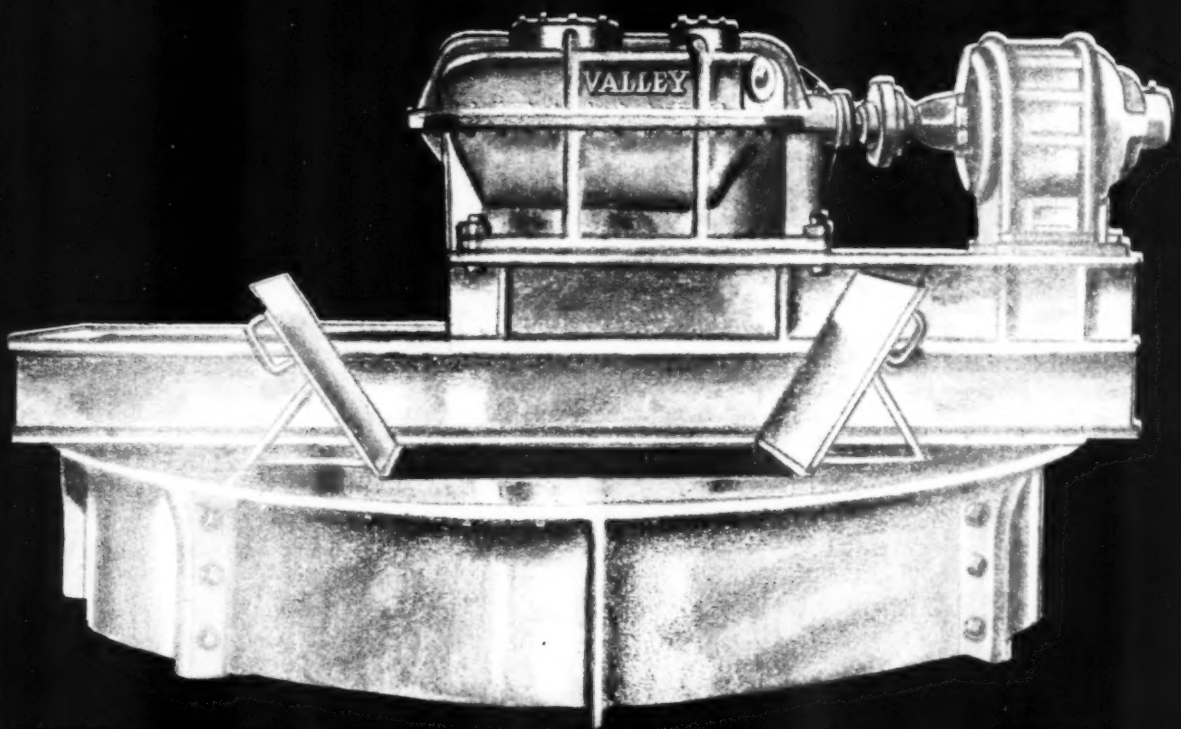
THE VALLEY-VORTEX PULPER



. . . introduces a <u>new</u> combination
of terrific pulping effects
in <u>ONE</u> GREAT PULPER



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Layne Vertical Turbine pumps are available in sizes to produce from 40 to 16,000 gallons of water per minute. High efficiency saves hundreds of dollars on power cost per year.

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LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

an unrehearsed analysis of the cause of a described accident in a sulphite pulp mill. The procedure followed the practice of compiling industrial accident causes, recommended by the American Standards Association in its approved Accident Cause Code.

Each essential point of information about an accident is referred to as an "accident factor." These accident factors are grouped into six major classifications:

(1) The agency (the defective object or substance most closely related to the injury)
(2) The agency part
(3) The unsafe mechanical or physical condition
(4) The accident type
(5) The unsafe act
(6) The unsafe personal factor.

Certain single occurrences, such as explosions, may result in injuries to a number of persons. This classification requires that an accident be tabulated for each person injured. The term "accident" is intended to include the factor leading to industrial (occupational) diseases.

The analysis was conducted by Mr. Braun assisted by two representatives of Employers Mutuals. These men assisted the entire assembly to determining *"What* is the cause!"—not *"Who* is to blame?" for the accident described as follows:

Emergency repairs at No. 2 Digester had interrupted the schedule of blows. At 8:00 p.m. such repairs were completed, and the cook issued an order to proceed with No. 2 "Blow." The cook's helper received the order and went directly to the basement to check openings and warn the blow pit man washing down in No. 3 Pit. The blow pit man had about three minutes washing time left and indicated he intended to complete the operation before leaving the pit. Meanwhile, because of a strong acid condition, the *No. 2 Pit basement opening* had been left open. The natural draft of the vomit stacks at each pit take up these strong odors in good shape. The blow pit man, however, did not mention this to the cook's helper when he was warned of the "blow" scheduled. The cook's helper "assumed" the door was in place, proceeded on up to the main floor to check the No. 2 top opening, and proceeded to blow No. 2 Digester.

Stock at No. 2 Digester was blown through the basement opening, giving the area at No. 2 and pits hot acid and stock. Fumes were caught up by the natural draft at No. 3 Basement opening and the blow pit man was in trouble.

Stock runners heard his cries for help, and ordered the digester helper to close the blow-off valve. The valve had been open about three minutes.

The six factors in this aaccident as classified in the Code were determined as being the following:

1—The agency: Chemicals
2—The agency part: SO_2
3—The unsafe mechanical and physical condition: Improper ventilation
4—The accident type: Inhalation
5—The unsafe acts: Failure to secure or warn
6—The unsafe personal factor: Improper attitude

Live by Learning

The National Safety Congress is held annually during fire prevention week. This season is simultaneous with the anniversary of the great fire which destroyed the city of Chicago. But from that fire, rose a city which is a monument to progress.

The student of safety learns invaluable lessons from every accident. A study of things that *do happen* oftentimes prevents a recurrence of that accident. The great national movement to bring all accidents down to that "irreducible minimum" is a vital part of world progress. A reduction in waste, loss, and suffering will not only make the world a happier and better world, but it will endow future generations.

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First Scores in New Safety Contest 1946-1947

▶▶▶ THE PAPER INDUSTRY safety contest which began July 1, 1946, shows 31 new entries, bringing the total number of contestants to 259. The fifty-six mills listed here have worked the first two months of the contest with a perfect record. The average frequency rate for all contestants for the two-month period (July and August) is 18.25. This is two per cent lower than the rate for the same period of last year.

Division I—Pulp and Paper

Group A

The Flintkote Co. (Pioneer Div.), Los Angeles, Cal.
The Flintkote Co., New Orleans, La.
Price Bros. & Co., Ltd., Riverbend, Quebec, Can.
Rhinelander Paper Co., Rhinelander, Wis.
Ontario-Minnesota Pulp & Paper Co., Ltd. Kenora, Ontario, Can.

Group B

Thilmany Pulp & Paper Co. (Upper Mill #1), Kaukauna, Wis.
P. H. Glatfelter Co., Spring Grove, Pa.
Kimberly-Clark Corp. (Badger-Globe Mills), Neenah, Wis.
International Paper Co. (Tonawanda Mill #55), North Tonawanda, N. Y.
Escanaba Paper Co., Escanaba, Mich.
Thilmany Pulp & Paper Co. (Lower Mill), Kaukauna, Wis.

EXPERT shop fabrication of sub-assemblies – as large as shipping facilities permit – makes possible simpler, faster, cheaper erection. These sub-assemblies – produced under ideal conditions and with the aid of equipment not always available in the field – are stress relieved, pressure-tested, checked for dimensional alignment, cleaned and inspected, and are ready to slip into place.

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525 Market Street, San Francisco
People's Gas Building, Chicago
Public Square Building, Cleveland
10 High Street, Boston
Heights State Bank Bldg., Houston
Whitehead Building, Atlanta

Price Bros. & Co., Ltd. (Jonquiere Mill), Jonquiere, Quebec, Can.

Group C

Strathmore Paper Co. (West Springfield Mills), West Springfield, Mass.
Certain-teed Products Corp., Savannah, Ga.
Oswego Falls Corp. (Sealright Div.), Fulton, N. Y.
Certain-teed Products Corp., Niagara Falls, N. Y.
Certain-teed Products Corp., E. St. Louis, Ill.
Certain-teed Products Corp., Richmond, Cal.
Certain-teed Products Corp. York, Pa.
Crown Willamette Paper Co. (Div. of Crown Zellerback Corp.), Lebanon, Ore.
Minnesota & Ontario Paper Co., International Falls, Minn.**
Container Corp. of America, Circleville, Ohio.*

Group D

Flintkote Co., Little Ferry, N. J.
Strathmore Paper Co. (Woronoco Mill #2), West Springfield, Mass.
The Mead Corp. (Wheelwright Div.), Leominster, Mass.
Marathon Corp., Ashland, Wis.
United States Gypsum Co., Oakmont, Pa.
United States Gypsum Co., North Kansas City, Mo.
Strathmore Paper Co. (Woronoco Mill #1), West Springfield, Mass.
Spaulding Fibre Co., Inc., Milton, N. H.
E. I. du Pont de Nemours & Co., Inc. (Russell Plant), Huntington, Mass.
International Paper Co. (Livermore Mill #3), Livermore Falls, Maine.
Certain-teed Products Corp., Buffalo, N. Y.
Alton Box Board Co., Carlyle, Ill.
The Mead Corp., Nashville, Tenn.
American Writing Paper Corp., Albion Division.
International Paper Co., Riley Mill #23, Riley, Maine.
Container Corp. of America, Wilmington, Del.**

Division II—Paper & Board Remanufacturing

Group A

Dixie Cup Co., Easton, Pa.**
Container Corp. of America, Medford, Boston.*
Container Corp. of America (35th St. Div.), Chicago, Ill.
Fort Orange Paper Co. (Box Factory), Castleton on Hudson, N. Y.
Container Corp. of America, Cleveland, Ohio.*
Container Corp. of America, Anderson, Ind.*

Group B

Old Colony Envelope Co., Westfield, Mass.
Bird & Son, Inc. (Roofing Plant), Shreveport, La.
International Cellucotton Prod. Co., Inc., Memphis, Tenn.
Fort Wayne Corrugated Paper Co., Rochester Division, Rochester, N. Y.
Bird & Son, Inc. (Roofing Plant), Chicago, Ill.
Container Corp. of America, Baltimore, Md.*
Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.
Flintkote Co. (Hollywood Paper Box Div.), Los Angeles, Cal.
Southwest Corrugated Box Co., Fort Worth, Texas.
Container Corp. of America, Philadelphia, Pa.*
Bay West Paper Co., Green Bay, Wis.
Gaylord Container Corp., Milwaukee, Wis.*

*July report missing.
**August report missing.

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HAZEL LEEDKE ELECTED CHAIRMAN OF INDUSTRIAL NURSING SECTION OF NSC

At the recent Annual Safety Congress held in Chicago, Mrs. Hazel Leedke, R.N., in charge of the health department of Thilmany Pulp and Paper Company, Kaukauna, Wisconsin, was named chairman of the Industrial Nursing Section of the National Safety Council.

Hazel Leedke

For the past two years, Mrs. Leedke has served as vice chairman of the Nursing Section, also Program Committee Chairman.

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▶▶▶ BROADENING OF THE GROUP insurance plan which is available to employees of the Brown Company, Berlin, New Hampshire, now extends the benefits of the program to all company employees and their families. For many years, a group insurance program has been carried by the Brown Company, extension of the benefits to all employees will become effective when an enrollment of 75 per cent is obtained.

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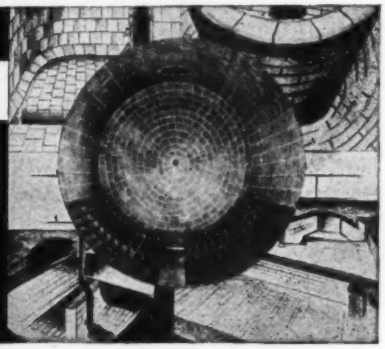

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Wherever it may be, one contract, one responsibility covers the complete installation. This involves; a study of your problems, a design based on the chemical and mechanical requirements involved, and a construction that will assure long life.

Consult Stebbins regarding your next lining installation.

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Third TAPPI Meeting In New Orleans

▶▶▶ THE LAST OF THREE fall meetings scheduled by the Technical Association of the Pulp and Paper Industry this year was held October 14 and 15 in the Roosevelt Hotel, New Orleans, Louisiana. These meetings have constituted a departure from the usual procedure of the national organization, since in years past, the customary practice was to hold one fall meeting each year. This third meeting was sponsored by the Alkaline Pulping Committee and the Chemical Products Committee of the Association.

The program started off with a session sponsored by the Chemical Products Committee. W. P. Lawrence, of The Champion Paper and Fibre Company, reported results of a questionnaire on Collection of Sulphate Turpentine sent to twenty-four mills which had contributed data showing yields ranging from 1.5 to 4.2 gallons per ton. One surprising statement, contrary to usual experience, was that in the respondent's mill, very little oil was collected before attaining full cooking pressure. Of even more interest to most of those present was the wide variation in types of condensing and separating equipment.

S. G. Norton, of Hercules Powder Company, followed with a report on a study of "Corrosion in Storage Tanks for Crude Sulphate Turpentine." He showed galvanized iron and pure nickel were most resistant but recommended a design of storage tank which prevents formation of vapor space above the surface of the liquid. By means of a liquid seal the oil layer is kept in contact with the tank cover at all times.

Dr. Paul R. Wiley, of West Virginia Pulp and Paper Company, presented an extremely valuable method of calculating "The Fuel Value and Soda Value of Tall Oil Skimmings" by means of nomographs. Following this presentation, he also reported on the "Present Status of A.S.T.M. Methods of Testing Tall Oil." The chairman of the session urged everyone who could possibly do so to co-operate in this work.

At the afternoon session, C. C. Porter, of Southland Paper Mills, Inc., reported results obtained in "Elimination of Lime Kiln Stock Losses with Type-N Rotoclone." The savings at Lufkin, Texas, in one year equal the entire cost of the installation. As in other mills, the reclaimed lime proved better than fresh lime. The reported savings were: lime reduced 90 per cent (from 150 lb. per ton to 15 lb.), soda contents of sludge dropped from 2.2 per cent to 1.2 per cent, saving 1,375 tons of salt cake per year. It was suggested this equipment could very easily be used to decolorize bleach waste. There was very lively discussion of this paper, and T. T. Collins, Jr., of Thilmany Pulp and Paper Company, told of a pilot plant dust collector which recovers 90 per cent of the soda from recovery furnace gases in saturated solution with only 1.5 hp. per ton of pulp and no extra labor.

There followed a presentation of a study of "The Effect of Tension During Drying on Sheet Strength" by J. E. Sapp, of Gaylord Container Corporation. Data presented indicated a loss of 16 per cent in Mullen test due to shrinkage under tension at the wet end, and another 20 per cent on the dryers. Commenting on these data, Vertrees Young, of Gaylord, remarked "we seem to be spoiling our sheet in the process of making it."

An outstanding contribution to the sessions of the first day was a paper by J. J. Goss and W. F. Gillespie on "Jordan Refining of Sulphate Pulp." Presented by Mr. Gillespie, this paper included a wealth of factual data obtained in a well-planned investigation of work done in the jordan. One very important conclusion suggests that it is a mistake to "pull off a jordan" in order to save power. Actually, more kw. per ton is required to produce the same effect when the plug is set with greater clearance.

The program of the first day culminated in a banquet at which one of the ladies was questioned very severely by the *maitre d'hotel* regarding surreptitious disappearance of sugar. Mr. Nicholson, president of TAPPI, as at the previous two meetings, highlighted his recent visit to Scandinavia.

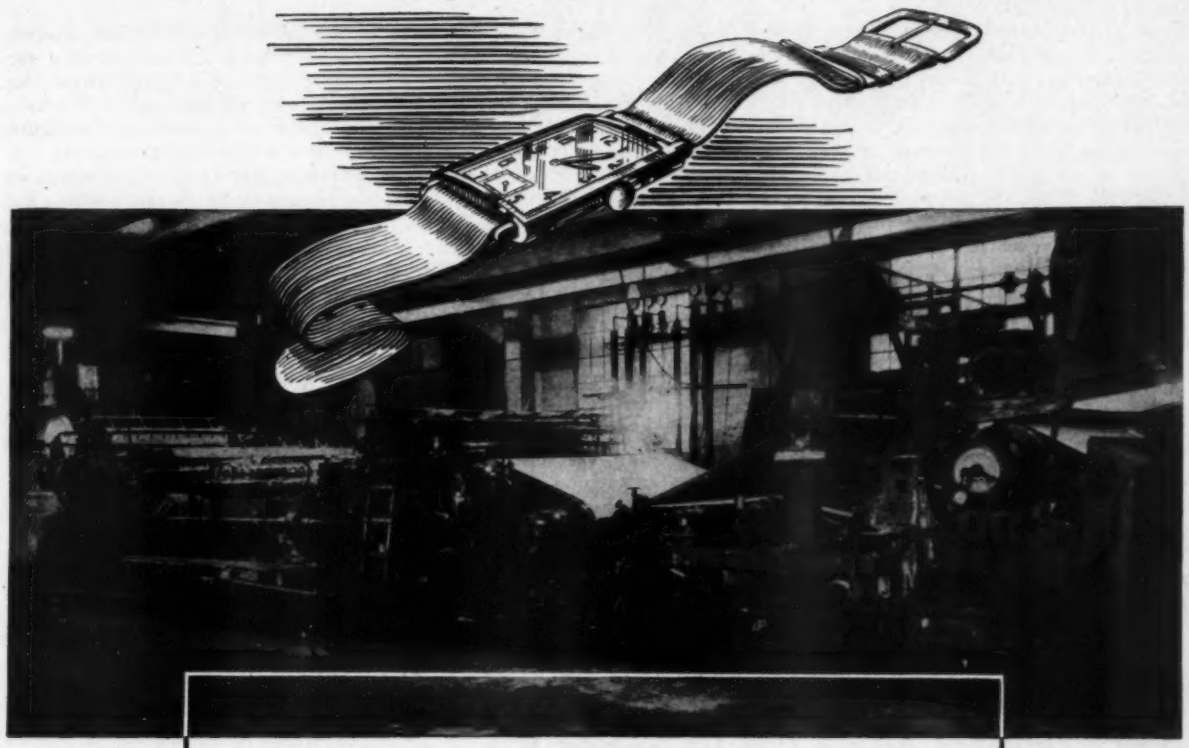
The second day of the meeting was devoted to symposia on washing sulphate pulp. P. J. Hannan, Southern Advance Bag & Paper Corporation, told of using open top diffusers and pointed to the opportunity for a soaking period which gives less channeling than washing under pressure. He admitted, however, that open top diffusers give a little weaker effluent liquor than closed diffusers (9.3 deg. vs. 9.7 deg. Bé. and 15 per cent solids) and said the operators prefer the closed diffusers.

Owing to illness, R. R. Fuller, of Gulf States Paper Corporation, was unable to present his paper on "Washing Pulp in Diffusers."

George W. Brumley, St. Marys Kraft Corporation, described the screw press washing system used at his mill. He said that when operated under conditions specified (viz. 4 tons per hour at 42 rpm), a soda loss in the pulp of 50 lb. (as salt cake) per ton using 85 gallons fresh water per minute was obtained. By changing pulleys, operations have been speeded up (to 6 tons per hour at 57 rpm) but soda loss is greater. In either case, for pulp of medium hardness (27 to 32 TAPPI), the evaporator feed liquor contains 16.5 per cent to 17 per cent solids. Harder pulps will plug and stall the screw and softer pulps will clog the perforations in the plates.

A. Suter, of Gaylord Container Corporation, presented results of washing on two-stage rotary vacuum washers. Two 9 ft. by 12 ft. drums used in parallel washed 300 to 350 tons per day with 2.8 lb. water per pound of pulp and a soda loss of over 100 lb., as salt cake, per ton. By putting half the tonnage over the two drums in series, i.e., with 4 stages in all, these figures were reduced to 2.5 and around 50 respectively. He said that the evaporator feed liquor contains around 3,000 lb. solids per ton of air dry pulp at a concentration of 15 per cent to 16 per cent and that the digester blow has a consistency ranging from 13 per cent to 15 per cent with liquor concentration of 20 per cent to 23 per cent solids. The mill cooks to a maximum hardness of 30 (TAPPI).

Discussion of these papers centered around comparison of screw presses and vacuum washers and the possibility of combining these items of equipment in the same mill. The



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Perhaps you are contemplating a new Fourdrinier, or a new vat section, or an entirely new machine for your present mill — or an entirely new mill expansion program. If so, Black-Clawson-Shartle and Dilts engineers would be glad to plan with you and submit estimates for your consideration.

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Associate: Alexander Fleck Limited, Ottawa, Ontario, Canada

screw press appeared to give a higher solids concentration in evaporator feed liquor, but to lack the flexibility of the vacuum washers. Experience of two other mills besides St. Marys with screw press installations, as reported at the meeting, paralleled the latter's as to amount of wash water used and soda retained in the pulp.

One very important consideration emphasized in the discussion is the difficulty of comparing results of different mills due to a number of variables likely to be overlooked. Among these variables are: character of water, method of determining residual soda; kind of wood used and even altitude above sea level (which affects vacuum attainable). During luncheon, various groups discussed these factors and other matters and upon re-assembling for the afternoon and concluding session, Mr. Sutter called on Mr. Gates, of The Champion Paper and Fibre Company (Canton, N. C.), to describe a quick method in use for routine determination of soda retained by the pulp. Reduced to its simplest terms, the method involved washing a known amount of pulp with a measured amount of distilled water, measuring the conductivity of the filtrate and reading from a chart the amount of soda. In making up the chart, a minimum of 25 lb. (as Na_2SO_4) per ton of air dry pulp was added in as experience had shown this amount could not be removed by washing.

R. C. Richter, of National Container Corporation, described the four single-stage washing system used at Jacksonville and gave results of a prolonged study which showed an overall dilution of less than 1.7 lb. of water per pound of pulp with an average soda retention of 40.7 lb. (as salt cake) per ton and 17.0 per cent average solids in evaporator feed liquor. He called attention to the effect of condition of face wire on washers—showing a drop to 26 lb. retained soda immediately after souring. Also, he mentioned the results of removal of knots by Jonsson screens which in one test showed a drop of 27 lb. per ton with a corresponding reduction of 1.0 point to *p*H of screened slush stock.

The final paper was presented by M. Klein, of Union Bag and Paper Corporation. His subject was "The Effect of Certain Variables in the Operation of Rotary Pulp Washers." He told of washing 400 tons of 32 hardness pulp, and 470 tons of 34 hardness with soda loss of 40 to 50 lb. per ton. This talk was illustrated by slides showing the installation with its instrument control panel.

Following the presentation of Mr. Klein's paper, the meeting was thrown open for general discussion of any topic desired. Among problems discussed were construction and corrosion of diffuser bottoms; and comparative power and maintenance costs for the several pulp washing systems. At the suggestion of T. T. Collins, Jr., J. N. Swartz, of Howard Smith Paper Mills Ltd., told of recovering heat and chemical by oxidizing sulphate mill black liquor. It was claimed that passing the furnace gases through three scrubbing towers effected recovery of 85 to 90 per cent of the chemical. At the same time, it was stated that water vapor was condensed in sufficient purity for use in pulp making with simultaneous recovery of considerable heat.

Presentation of the charter which made the Chicago Professional Paper Group a local section of TAPPI is made by K. P. Geohegan (right) to F. D. Long, president of the group. Mr. Geohegan is chairman of the Local Sections Committee of the national body of the Technical Association of the Pulp and Paper Industry

◆

CHICAGO PRO PAPER GROUP NOW A SECTION OF TAPPI

The growth of the Chicago Professional Paper Group, which held its first meeting in 1943, has resulted in its official recognition as a local section of the Technical Association of the Pulp and Paper Industry.

The Charter and Banner of TAPPI were formally presented to the Group at the October 21 meeting by K. P. Geohegan, national executive committeeman of TAPPI. In his presentation address, Mr. Geohegan outlined the functions of TAPPI, describing the benefits that would accrue through this affiliation. He complimented the Group on its diversity of interests, and its large, representative membership.

Guest speaker at the October meeting was Vaughn Jones, service manager, Hill Blackett & Company, Chicago. Mr. Jones sketched the functioning of an advertising agency, including copywriting, artwork, and space buying.

The Chicago Professional Paper Group was organized December 6, 1943, and has held regular meetings once each month, except during vacation months.

◆

▶▶▶ CERTIFICATE OF MERIT was awarded to the National Fire Prevention Society of Boston at the Twenty-seventh Annual Convention of the American Trade Association Executives in Cleveland, October 11. The Boston fire control educational organization which has an enrollment in forty-one countries in the world celebrates its fiftieth anniversary this year. The success of achieving coordination with the War and Navy Departments in lessening the loss of life and property due to fire attained by the educational efforts of the Boston organization was responsible for its winning the award.

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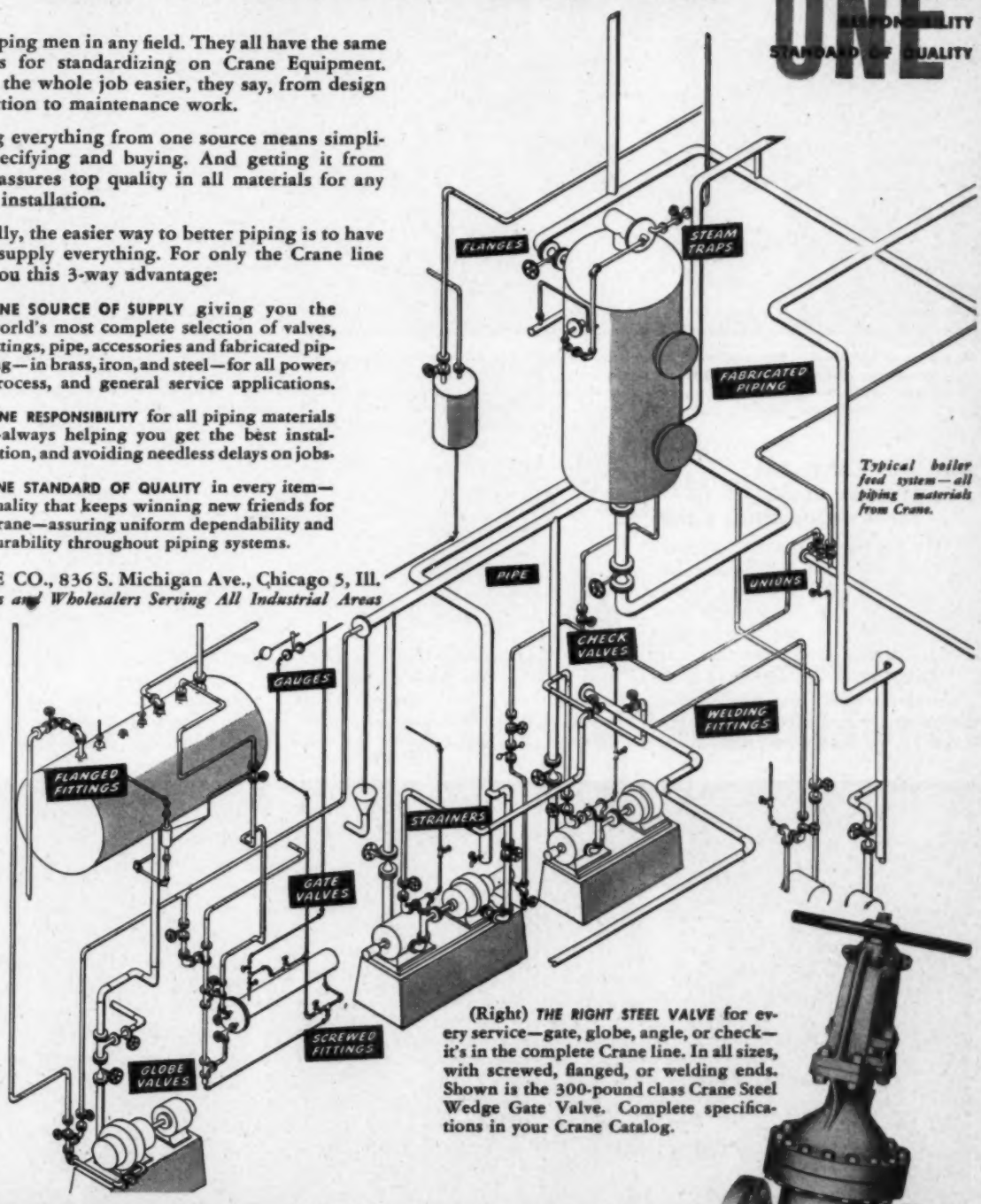

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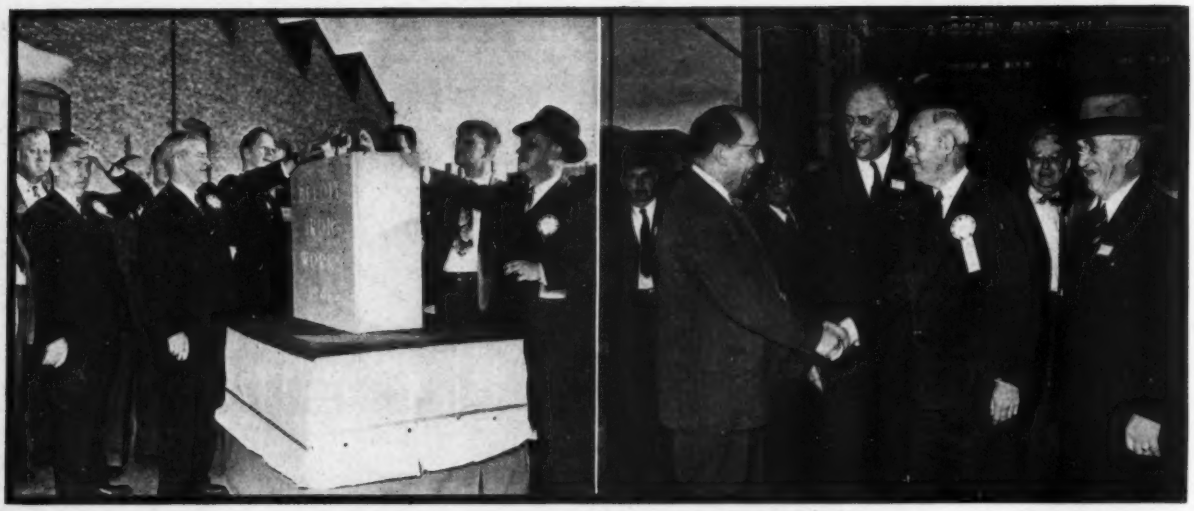


Members of TAPPI were entertained by Beloit Iron Works one day during the recent Engineering Conference held in Milwaukee. At left, guests are shown dropping their business cards into the cornerstone for a new plant addition at Beloit Iron Works, Beloit, Wis. At the right, G. W. E. Nicholson, of Union Bag and Paper Corporation, and president of TAPPI (extreme left) is greeted by (L to R): John Stadler, of Stadler, Hurter and Co.; E. H. Neese, president and treasurer of Beloit Iron Works; and C. E. Youngchild, consulting engineer, of Appleton, Wis.

AFFILIATE PLANTS ARE VISITED BY DELEGATES TO TAPPI ENGINEERING CONF.

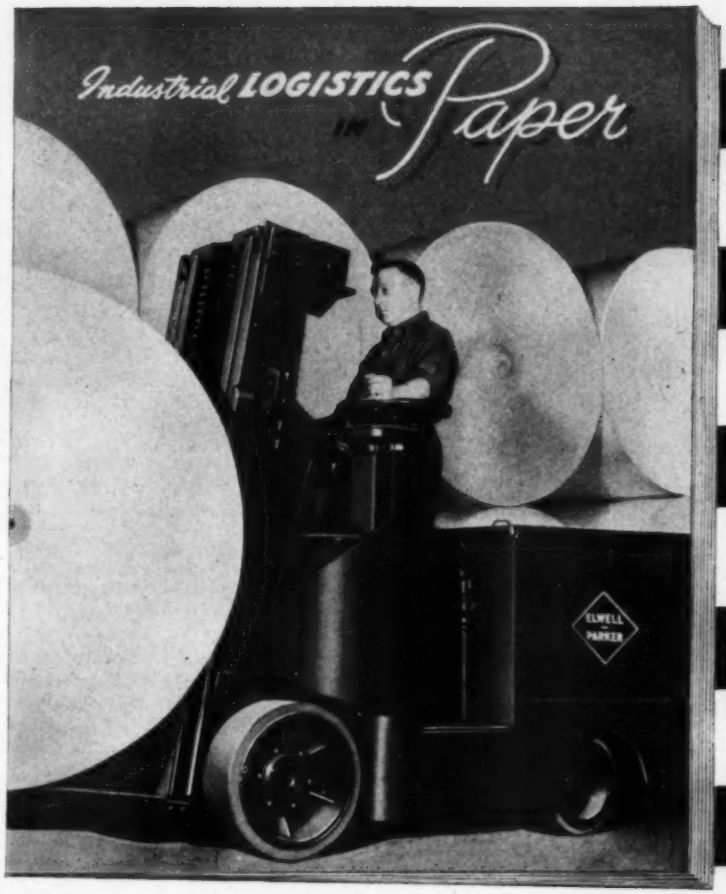
At the inaugural TAPPI Engineering Conference held in Milwaukee recently (Cf. P.I. & P.W., Oct., 1946), a large number of the delegates were privileged to visit two of the large manufacturing plants near that city.

"TAPPI Day" was celebrated at the plant of the Beloit Iron Works. Special train accommodations were provided by the Beloit company, returning the group to Milwaukee. The visitors were taken for a tour through the plant and all participated in ceremonies attending the laying of the cornerstone for the company's new building. The visitors were asked to write something or use business cards which would be sealed into the cornerstone box.

The new building under construction will increase Beloit's shop facilities by half. Work was started recently when the OPA gave approval. Permission to proceed with this week was given, according to the company's explanation, because the facilities will be devoted exclusively to the manufacture of papermaking machinery. Following the tour, the guests were entertained with a special evening of dinner and entertainment.

The final day of the conference in Milwaukee was devoted to a tour of the West Allis plant of Allis-Chalmers Company, where the TAPPI members inspected a new high density feeder being operated in the company's research building in connection with

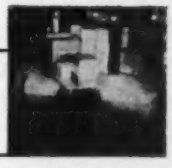
One of the events during the recent TAPPI Engineering Conference held in Milwaukee recently was a visit to the plant of the Allis-Chalmers Manufacturing Co., at West Allis, Wis. At left, delegates inspect a dryer shell being machined on a 40-ft. boring mill, one of the largest machine tools in this hemisphere. They were accompanied by R. K. Prince (extreme left in the group), engineer in charge of the company's cellulose and chemical industries section. . . . At the right is shown Frank R. Forrest (left center, facing camera), A-C application engineer, explaining features of a new high density feeder in the company's research building



PULP MANUFACTURING

PAPER MANUFACTURING

PAPER DISTRIBUTION



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TAPPI engineers were, of course, particularly interested in the heavy equipment that is being built by A-C for paper mills.

◆

DWIGHT STOCKER NOW AN HONORARY LIFE MEMBER OF MICHIGAN DIV. SUPTS.

Dwight Stocker, president of the Michigan Paper Company, Plainwell, Michigan, is now a life member of the Michigan Division of The American Pulp and Paper Mill Superintendents Association. This honorary award was bestowed by Mr. Stocker at the October meeting of the Division in Kalamazoo because of his generous and sympathetic attitude toward the Association over the past several years.

During the diffcult war years, Ray Barton, superintendent of the Michigan Paper Company, served as national president of the Superintendents Association. Throughout his incumbency, Mr. Stocker was most liberal in his attitude toward the many extra demands that were made on Superintendent Barton's time. It was partly because of this splendid co-operative attitude that Ray Barton was able to do such outstanding work while in office. Members of the Superintendents Association deeply appreciate the keen interest in the welfare of that body shown by Mr. Stocker.

Presentation of the honorary life membership was made by Fred C. Boyce, first national president of the Association and for more than twenty years active in its councils.

A loving welcome was extended to Robert L. Eminger, former national secretary of the Association, who made a special trip to Kalamazoo for the presentation.

◆

CANADIAN PACIFIC COAST NEWLY FORMED TECH. SEC. HOLDS INAUGURAL MEETING

Organization of the Pacific Coast Branch of the Canadian Pulp and Paper Association, Technical Section was ratified by the Technical Section Council on August 20. The first meeting of the newly formed section was held October 11, at Vancouver, British Columbia, under the auspices of the Canadian association.

Douglas Jones, secretary-engineer of the Technical Section was present for the occasion of the West coast branch opening meeting; and he renewed acquaintance with paper men of the Pacific coast area with whom he worked during the organizational phases of their association.

Presentation of an honorary life membership in the Michigan Division of the Superintendents Association is made by Fred C. Boyce to Dwight L. Stocker. Left to Right—Walter F. Wolfe, chairman Michigan Division; C. W. Cassell, secretary-treasurer; Fred C. Boyce, first president of the national Association; Robt. L. Eminger, past national secretary; Dwight L. Stocker, president and general manager, Michigan Paper Co.; Wm. H. Astle, first vice chairman, Michigan Division

Also present at the meeting was A. E. Cadman, general manager of the Canadian Pulp and Paper Association, who addressed a luncheon meeting of the group.

In his speech, Mr. Cadman took the long-view of the paper industry's outlook. He warned the meeting that conservation of timber was essential and that good forestry practices were necessary looking toward the day (should adequate conservation measures not be taken by papermakers) that government control of the industry might be possible. Mr. Cadman maintained the view that the high standards of production must be carried out by the Canadian paper manufacturers to insure reaching a satisfactory place in world markets.

Norman R. Chapell, who is with the pulp and paper division of the Department of Trade and Commerce, Foreign Trade Service, spoke to the gathering. Mr. Chapell urged the industry not to rest on laurels it gained during wartime, but to keep harder at the job in order to meet competition offered by other countries.

◆

CANADIAN TECH. SECTION MEETS WITH THE EMPIRE STATE SECTION OF TAPPI

A joint meeting of the Empire State Section of the Technical Association of the Pulp and Paper Industry and of the Canadian Pulp and Paper Association, Technical Section was held on Wednesday, October 9, at Prospect House, Niagara Falls, New York.

Dr. Alfred Nadelman, chairman of the local section, introduced several of the prominent members attending the meeting. Among these were: R. G. MacDonald, secretary-treasurer of the national TAPPI organization; Dr. John Campbell, chairman of the state section; Malcolm Orchard, chairman of the Niagara branch of the Canadian association.

Principal speakers of the meeting, Dr. J. A. Van den Akker, head of the Physics Department of the Institute of Paper Chemistry, Appleton, Wisconsin, was introduced by R. D. Rusch.

Dr. Van den Akker's subject was "Instrumentation" and he talked concerning the fundamental aspects of measurement as applied to the physical properties of fibers and fillers used in the manufacture of paper and container boards. In his address, Dr. Van den Akker pointed out the necessity for studying the significance of data derived by measurement in its relation to the property to be measured.

Illustrating each point by mention of practical methods of testing developed, Dr. Van den Akker traced the methodology of measurement. He held that significant measurement is not possible unless the quantity to be measured can be accurately defined. Often the accuracy of definition depends upon whether the property to be evaluated is fundamental or only associated with use requirement. Methods of measurement are either direct or indirect, the indirect method requires careful analysis to determine their correlation, accuracy, and precision.

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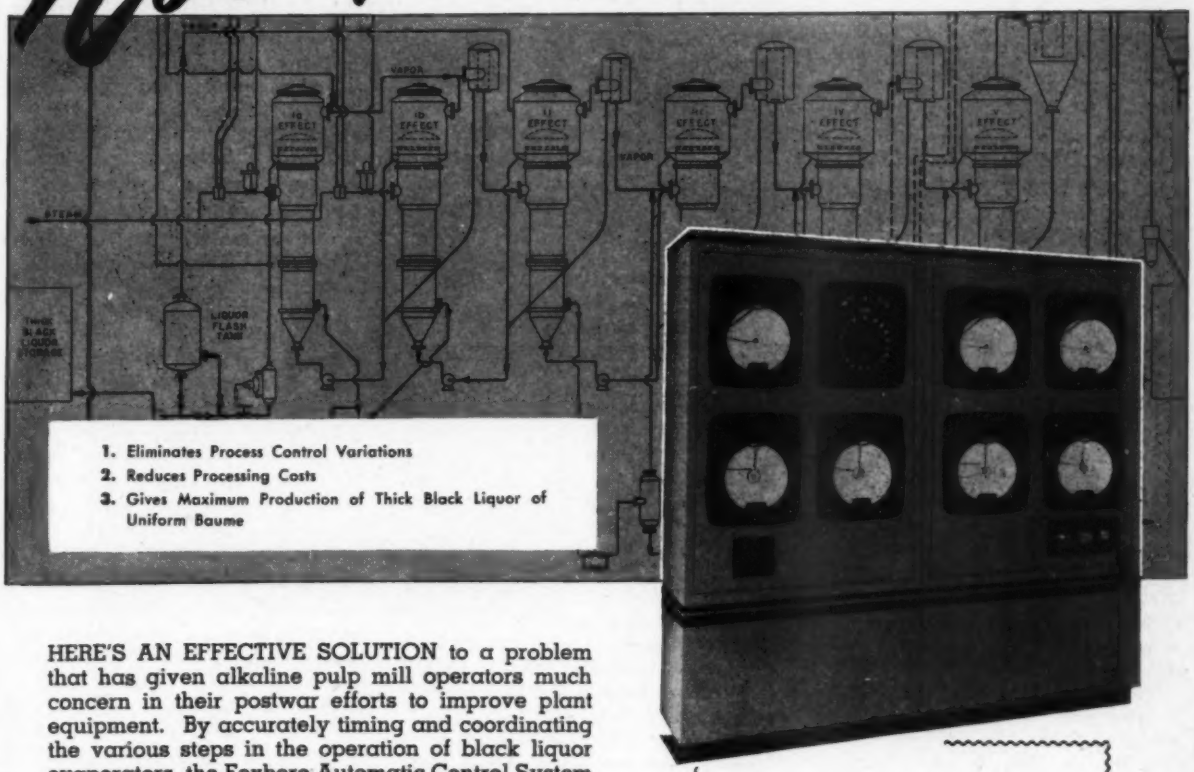

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COWLES COMPANY SUES FOR HYDRAPULPER INFRINGEMENT

The Black-Clawson Company has announced that The Cowles Company of Cayuga, New York, owner of patents covering the Cowles Hydrapulper, has recently filed suits for patent infringement against San-Nap-Pak Mfg. Company, Inc., Wheelwright, Massachusetts, and Frost White Paper Mills, Inc., Salisbury Mills, New York, charging that these mills are infringing the Cowles patents by using Apmew pulpers sold by American Paper Machinery and Engineering Works, Inc., of Glens Falls, New York. The suits were filed in the United States District Court for the Southern District of New York, and demand an accounting for profits and damages as well as an injunction against further use of the machines.

The Black-Clawson Company is licensed under the Cowles patents, having acquired license rights at the time it took over the Dilts Machine Works of Fulton, New York. The Dilts company developed the Hydrapulper in co-operation with the Cowles Company and was the first to offer these pulpers to the trade. Since the merger of Dilts with the Black-Clawson Company, Hydrapulpers have been sold through both the Dilts and Shartle divisions of the Black-Clawson Company, which also appears as co-plaintiff in the infringement suits.

◆

SWENSON COMPLETES SPRAY DRYER RESEARCH BUILDING

For twenty-five years the Swenson Evaporator Company (a division of Whiting Corporation, Harvey, Illinois) has carried on extensive research at the University of Michigan in the fields of heat transfer, crystallization, and filtration pursuant to company policy which holds that the essence of progress in the chemical industry is research and development. Three years ago Swenson acquired the Douthitt-Gray-Jensen Spray Dryer, and in line with company policy a threefold research program has been carried out.

The Spray Dryer Research Building has been completed culminating the spray dryer research development. The phases of this program involved fundamental research, application of knowledge to improving dryer equipment and broadening industrial applications, and close customer relationship in testing products submitted by Swenson industrial associates for investigation.

With the added facilities offered by the new building, which is located at the Whiting plant in Harvey, Illinois, it is possible to further study by-product recovery and drying of both organic and inorganic materials for commercial uses. Continuing research in the field under plant scale conditions will allow the compilation of data which will be useful in handling all pumpable materials.

Swenson spray dryer research building

◆

▶▶▶ SALE OF LITHCOTE, the corrosion-resistant coating and lining material which has been widely used in the Canadian pulp and paper field has been taken over by the Bedford Development Corporation, 230 Park Avenue, New York City, representing the Lithgow Corporation of Chicago. In addition to its use on pulp and paper mill equipment, Lithcote has been successfully applied to processing equipment as well as chemical tanks and tankers.

◆

STONE AND WEBSTER MAKE "A REPORT TO THE PEOPLE"

Published as a survey of wartime design, engineering, and construction discoveries, *A Report to the People*, recently released by Stone & Webster Engineering Corporation, for limited distribution, gives new insight into the vastness of the problems connected with construction engineering, and it portrays the scope solution of the problems will have in industry.

The book is a 150-page essay which combines textual material prepared from interviews with engineers who handled the design and construction work on wartime projects ranging from 30-caliber ammunition plants to the atom bomb development. Supplementing the textual material are 200 photographs of the stages in the solution of the problems met by wartime engineering.

◆

B. M. BAXTER ESTABLISHES ENGINEERING PRACTICE

The dissolution of the firm Polleys & Baxter, paper mill chemists, Middletown, Ohio, became effective October 24.

B. M. Baxter, affiliated with that business, advises that he will continue in engineering practice with his son, W. P. Baxter, formerly with the Navy. Their business will be conducted under the name of Baxter & Son, Room 205, 1347 Central Avenue, Middletown. Mail should be addressed to Middletown, P.O. Box 441.

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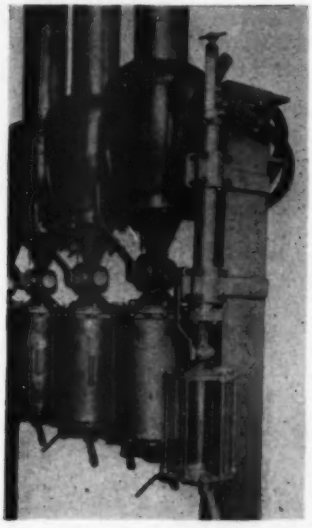

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CONSTRUCTION COMPLETED ON RYERSON OFFICE ANNEX

Construction has been completed on an office addition to the structural shop office building of Joseph T. Ryerson and Sons, Incorporated, of Chicago. The new facilities will house the estimating and drafting divisions of the structural shop department.

The new annex joins the south warehouse of the company and provides 6,500 square feet additional floor space, as well as grouping the personnel, engineers, and draftsmen to better co-ordinate the activities of the department.

Annex to Ryerson's structural shop office building

◆

▸▸▸ WEST COAST DEMANDS for paint and allied products manufactured by the Pittsburgh Plate Glass Company, Pittsburgh, Pennsylvania, have brought about the purchase of the Morck Brush Manufacturing Company (San Francisco). The men who formed the latter company emigrated from Denmark prior to the establishment of the West coast plant. The new division added to the Pittsburgh Plate Glass organization will be directed by Frank F. Tippett, formerly associated with the company's Baltimore plant.

◆

▸▸▸ ACQUISITION OF the Simplex Valve and Meter Company, Philadelphia, has been announced by The Permutit Company, New York City. The co-operation of the engineering, research, and sales organizations of the two companies has many advantages which will accrue to Permutit. Operation of Simplex will continue under the company's own name. H. W. Foulds, president of Permutit, also assumes the presidency of the Simplex organization while W. H. Roth, former president of Simplex, becomes chairman of the board of that company.

◆

▸▸▸ DISTRIBUTION ON THE Pacific coast for the new line of paper cutters, multiple head drill slotters, and multiple head round hole drilling machines manufactured by E. P. Lawson Company, New York City, will be handled by Harry W. Brintnall Company, Incorporated. The three branches of the West Coast firm located in Los Angeles, San Francisco, and Seattle will be so organized as to make installations and render service to Lawson equipment users in California, Arizona, Nevada, Oregon, Washington, Idaho, Montana, and Hawaii.

◆

H. K. FERGUSON COMPANY DEVELOPS A LOW COST INDUS. BUILDING DESIGN

Announcement has been made by The H. K. Ferguson Company, Cleveland, Ohio, that it has developed a modern, steel frame, fire resistant factory building which can be built for three dollars per square foot. The construction cost range of prices for conventional and individually designed industrial structures is five to seven dollars per square foot at the present time.

The new low cost development is a typical building for a typical industry, as the Ferguson company emphasized; it can best be utilized for warehousing, machine shops, and light manufacturing plants.

The announcement states that this three dollar-a-foot building has many limitations. It is definitely not the answer to every manufacturers' building problem. Instead, it is merely an economical way to provide minimum floor space requirements. It is estimated that part of these structures can be ready for useful occupancy by an owner six months after a specific project has been approved by the OPA.

◆

Housing Department

Housing for a big induced draft fan that will be installed in the power plant of a southern paper company receives final adjustment at the B. F. Sturtevant Co. Div. of Westinghouse Electric, Hyde Park, Mass. The fan, every minute, will remove 90,000 cu. ft. of the hot gases formed by fuel combustion in the power plant boiler

◆

Ready to ROLL up a record . . . in pulp screening

PERFORATED MONEL PLATE aids the efficiency of centrifugal pulp screens made by Trimbey Machine Works, Glens Falls, N. Y. Strong and wear-resistant, Monel plates hold the size and shape of their perforations longer than other materials.

Do perforations in your screen plates soon lose their size and shape?

Then here's a suggestion:

For your *next* screens, switch to Monel*. . . and see how much longer they last.

Used in centrifugal pulp screens made by *The Trimbey Machine Works,* Glens Falls, N. Y., perforated Monel plate is reported to outlast other first-line screen plate materials as much as two to three times.

That's not unusual, either, when you consider the properties of Monel.

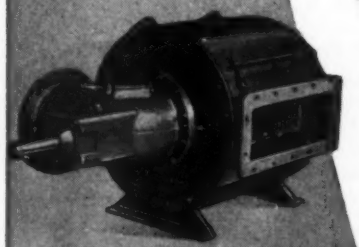
Stronger and tougher than structural steel, Monel is immune to rust, and highly resistant to corrosion by acid and alkaline stocks and solutions.

Monel has high fatigue strength. It withstands wear and abrasion. Perforations remain smooth. Screens don't clog. They not only last *longer*—they serve *better.*

Experienced fabricators find Monel easy to work. Perforations may be as small as 0.055"... or more than an inch in diameter.

Wherever corrosion causes trouble, consider Monel. Use it to construct troughs for charging pulp to flat screens, for example. Monel surfaces are easy to keep clean. They don't accumulate slime and fibre.

And whenever you'd like help in picking the *right* metal for a corrosive pulp or paper mill job, remember that INCO's Technical Staff is always at your service. No fee or obligation. Just write and tell them your problem.



COMPLETELY ASSEMBLED Trimbey centrifugal pulp screen unit. Its Monel screen plates are automatically cleaned twice during each revolution of rotors.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

MONEL

NICKEL (INCO TRADE MARK) ALLOYS

MONEL* • "K" MONEL* • "R" MONEL* • "KR" MONEL*
"S" MONEL* • INCONEL* • NICKEL • "L" NICKEL* • "Z" NICKEL*

*Reg. U. S. Pat. Off.

NAMES in the News

PERSONALS

ENGLISH PAPERMAKERS VISIT U. S. AND CANADIAN MILLS

Two representatives of the Imperial Paper Company, Limited, of England, have been touring the paper mills and allied industrial plants in the country and Canada.

M. L. Hobday, general manager, and John Lawton, mill superintendent of the Imperial company's mill began their tour of inspection in August with a visit to the headquarters of the Paper Makers Chemical Department of the Hercules Powder Company in Wilmington, Delaware. Later, in their visits to mills on the East coast, Mr. Hobday and Mr. Lawton were entertained at a Rotary Club luncheon in Holyoke, Massachusetts. Their host for the occasion was C. H. Kent, resident manager of the Holyoke plant of Hercules' PMC departments.

By following a close schedule, Mr. Hobday and Mr. Lawton were able to extend their tour to midwestern papermaking plants and equipment manufacturers, and to visit Canada.

The Imperial Paper Company's mill at Graveshead was hard hit during the Blitz of 1940; according to Mr. Hobday and Mr. Lawton twelve of the fourteen machines operated in the mill were damaged. The purpose of the visit these gentlemen made to this country was to study recent technological advances made in the North American papermaking industry. Production in their own mill is just getting under way, and two new paper machines are being built in England for installation at the Graveshead plant.

Their tour completed in mid-October, Mr. Hobday and Mr. Lawton returned to England.

◆

MARATHON PROMOTES THREE TO HIGHER SALES POSTIONS

Three sales executives of the Marathon Corporation have been appointed to new positions with the company's sales organization according to announcement made by Donald A. Snyder, director of sales. The appointments are part of a program of sales administrative and staff changes made to handle the increased sales resulting from the manufacturing expansion project.

The new general sales manager, A. W. Stompe (Neenah) will direct all of Marathon's field selling activities. Mr. Stompe has had twenty years experience in the selling branch of the organization.

Russell C. Flom (Menasha), who has been appointed manager of sales promotion, is a long-time executive of the company having been office manager, war products sales manager, and manager of specialty packing sales.

Marathon's Eastern sales division manager will be R. A. Nash (Neenah), who for many years has been a New York sales representative for the company. He will make his headquarters in the company's New York office.

◆

GEO. TORRENCE NOW HEADS LINK-BELT AS PRESIDENT

Formerly executive vice president of Link-Belt Company, Chicago, Illinois, George Torrence became president of the firm, November 1.

The new president's experience with Link-Belt dates back to 1911 when he became an employee of the company as a draftsman after having served as an oiler in the power plant of Ayer & Lord Tie Company and having been apprenticed in the shops of the Westinghouse Air Brake Company. During his twenty-five years with Link-Belt, Mr. Torrence has handled many jobs. From 1926 to 1932 he managed the Indianapolis operations, and became president from 1932 to 1936.

George P. Torrence

Mr. Torrence succeeds William C. Carter who has retired, but who will remain as a consultant to benefit the organization with his wide experience.

◆

MANAGEMENT CHANGES IN GARDNER-DENVER COMPANY

Rounding out almost twenty-four years association with the Gardner-Denver Company, G. V. Leece, vice president of the organization, has been named to the position of general sales manager. During the past two years Mr. Leece has been vice president in charge of the company's export division with offices in New York. Previous to that time he was district manager of the New York office, he has also headed the Pacific Coast branch of the company.

Representing Imperial Paper Co., Ltd., of England, General Manager M. L. Hobday (left) and Mill Superintendent Joseph Lawton (right), are shown during their American tour at a Rotary Club luncheon in Holyoke, Mass. Their host in Holyoke was C. H. Kent (center), resident manager of the Paper Makers Chemical Department, Hercules Powder Co.

Reduce Danger Of Suckbacks In Chlorine Lines

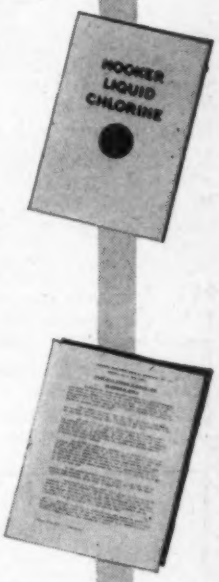
Are you experiencing suckbacks in your Chlorine lines when pressure is low? If so, you are probably finding it necessary to replace corroded valves frequently. There are methods of reducing the danger of these suckbacks, to get longer life from your valves, and reduce corrosion of your equipment.

Hooker Bulletin 208 prepared by our Technical Staff, gives clear directions on how to install a suckback pipe or where necessary, a vacuum break valve in your lines to reduce the corrosive effects of suckback. This is only one of a series of Bulletins that are helping pulp and paper makers get the most out of their chemicals and equipment.

The Hooker Liquid Chlorine Booklet is another Bulletin that should be in your chemical library. It contains general information about Chlorine, its shipment, handling and storage as well as particular information about its use in the pulp and paper field.

All Hooker Bulletins are available when requested on your letterhead. Send for these two now and for a list of the other Hooker Pulp and Paper Bulletins.

And for pulp and paper chemicals of uniformly dependable high quality, continue to specify Hooker Chlorine, Caustic Soda, Muriatic Acid and Sodium Sulfide as leading pulp and paper mills have been doing for years.



HOOKER ELECTROCHEMICAL COMPANY
8 Union Street
Niagara Falls, New York

New York, N. Y. Tacoma, Wash.
Wilmington, Calif.

HOOKER CHEMICALS

Caustic Soda Chlorine Muriatic Acid Sodium Sulfide

8455

D. P. Tunnicliff has succeeded B. P. Spann as advertising manager of the company. Mr. Spann has been promoted to the position of director of personnel and industrial relations and will handle all factory and office personnel at the Gardner-Denver Quincy, Illinois, plant.

◆

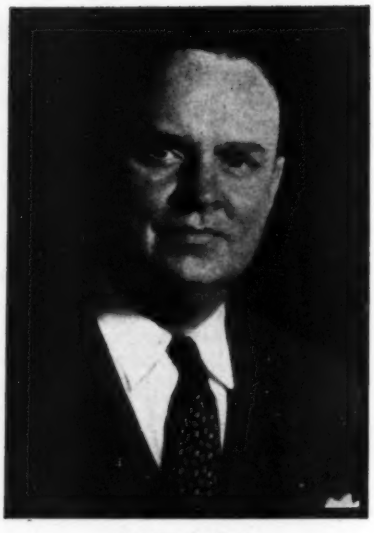
▶▶▶ Management changes which became effective in the organization of the River Raisin Paper Company, Monroe, Michigan, October 23, have advanced *J. Frank Gray,* formerly president of the company, to the position of chairman of the board. *Charles I. Wood,* who has held the post of vice president and general manager of the firm, has been named president and general manager. *J. W. Walter* will continue in his position as secretary-treasurer; and *E. C. Hollingsworth,* who in the past has been general sales manager, has been promoted to the position of vice president in charge of sales.

◆

▶▶▶ Formerly connected with the Ethyl Corporation and Sharples Chemicals, *Joseph H. Fulmer* has joined the engineering department of the Pennsylvania Salt Manufacturing Company. Mr. Fulmer is a member of the American Chemical Association.

C. R. Dobson

▶▶▶ Supervision of the seven manufacturing plants of the H. K. Porter Company, Pittsburgh, Pennsylvania, will be directed by *C. R. Dobson* who has been elected vice president in charge of operations. Following the retirement of *Frank J. Hinderliter,* founder of the Hinderliter Tool Company (Tulsa, Okla.), a division of H. K. Porter, *George A. Hays* has been appointed vice president and general manager of the division.



George A. Hays

▶▶▶ Transfer of *Russell P. Proffitt,* Chicago divisional manager of The Timken Roller Bearing Company, Canton, Ohio, to Washington (D. C.), where he will be district manager, has been announced by the company.

◆

TAYLOR NAMED ASSISTANT VICE PRESIDENT OF CROWN-ZELLERBACH CORPORATION

Directing industrial and public relations for the Crown-Zellerbach Corporation, San Francisco, is Kenneth I. Taylor, who has assumed his new duties as assistant to the vice president of the company, Alexander R. Heron.

Mr. Taylor has served as secretary-treasurer of the Massachusetts State Federation of Labor and as a member of the Massachusetts Labor Commission. During the last war, he conducted the tour for the Sullivan Family (five brothers were lost in the sinking of the U. S. S. Juneau) to stimulate activities among shipyard workers. Mr. Taylor retired from the Naval Reserve after forty months service as a Lieutenant Commander.

◆

▶▶▶ Superintendent of the Crocker Division of the American Writing Paper Corporation, Holyoke, Massachusetts, *Howard Ferguson,* has resigned to accept a position as superintendent of the Curtis Paper Company, Newark, Delaware.

◆

▶▶▶ Elected to the board of directors of the Harris-Seybold Company, Cleveland, Ohio, are: *N. O. Scourfield* and *W. C. Dunn,* prominent Cleveland industrialists, who will fill the positions vacated by *Samuel Wasserman* (retired) and *Howard N. Rosensteel,* who passed away recently.

Type GGU
Another Distinguished PUMP "by Aurora"
SIDE SUCTION CENTRIFUGAL
Capacities to 1400 G.P.M.
Heads to 190 Ft.
AURORA CENTRIFUGALS
for Every Pumping Job
HORIZONTAL SPLIT CASE
Single & Two Stage
SIDE SUCTION
VERTICAL
NON CLOG
SUMP
MIXED FLOW
SPECIAL DESIGN
Write for CONDENSED CATALOG "M"
or
Consult SWEETS
Wherever liquids play an important or incidental part in industrial processing, this Aurora Type GGU serves perfectly and with lasting efficiency. Because the casing is separate from the bearing bracket, the need for special metals to handle corrosives is minimized. Discharge may be placed in any of eight positions. We commend these pumps for high satisfaction and economy.
APCO TURBINE-TYPE PUMPS
For high pressure, small capacity requirements (up to 150 g.p.m.). Wide operating range characteristics. No metal to metal contacts. Handles non-lubricating liquids without wear. Only one moving part — the Impeller.
Write for CONDENSED CATALOG "M"
or
SEE OUR CATALOG IN SWEET'S
AURORA Always PUMPS
AURORA PUMP COMPANY
110 Loucks Street, AURORA, ILLINOIS

It's the SIDE OF A V-BELT that DOES the WORK! and GETS the WEAR!

V-Belt In Sheave

Clearly, it's the sides of a V-Belt that do all the gripping on the pulley and get all the wear against the sheave-groove wall. That's why longer life for the sides means longer life for the belt!

That's Why the CONCAVE SIDE (A GATES PATENT) is IMPORTANT!

Look at any V-Belt in its sheave groove and you *see at once* that the sidewall is the part that gets the wear!

The *sidewall* is what grips the pulley. The sidewall picks up the power from the driver pulley, transmits that power to the tension member, then grips the driven pulley and transmits the power to it!

That explains why you have always noticed that the sidewall of the *ordinary* V-Belt is the part that wears out first. Clearly, anything that lengthens the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, *straight-sided* V- Belt gets excessive wear along the *middle of the sides.* They show also why the Patented Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

Straight Sided V-Belt — FIG. 1

How Straight Sided V-Belt Bulges When Bending Around Its Pulley — FIG. 1-A

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall — FIG. 2

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley — FIG. 2-A

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

MORE Important NOW Than Ever Before!

Now that Gates Specialized Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

4611

Gates

THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER CO., Denver, U. S. A.

World's Largest Makers of V-Belts

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries

MALINA SALES MANAGER FOR HEATING AND VENTILATING DIVISION OF D. J. MURRAY

Appointment of O. J. Malina as sales manager of the heating and ventilating division of D . J. Murray Manufacturing Company, Wausau, Wisconsin, has been announced. Mr. Malina will make his headquarters at 43 East Ohio Street, Chicago, Illinois.

For over sixteen years, Mr. Malina has been connected with the development and growth of Grid Unit Heaters, Blast Coils, and air conditioning equipment. Because of the large demand for these products manufactured by Murray, centralization of sales management of the heating and ventilation division has been necessary. Mr. Malina, who has been midwestern representative for the company, brings wide experience to his new position.

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▶▶▶ Former New England representative for United Paperboard Company, New York City, *Norman Olson* has been transferred to the regional sales offices of the company in Chicago.

◆

▶▶▶ Formerly newsman on the staff of the *New York Times, Frank MacMillan,* has joined the American Standards Association as director of information. Prior to his connection with the *Times,* Mr. MacMillan was financial news editor for the Associated Press. In his new capacity with ASA, he will supervise an expanded educational program designed to inform the public and interested technical groups of the activities of the association.

◆

▶▶▶ The Bjorksten Laboratories, of Chicago, announce that *Dr. C. Robert Moulton* has become a member of its staff as research associate. As curator of chemistry at the Museum of Science and Industry in Chicago, several years ago, Dr. Moulton made many contacts in the paper industry preliminary to installing exhibits demonstrating papermaking. Since leaving the Museum, he has been working as a consultant; he also has done some work with the Illinois Institute of Technology.

◆

▶▶▶ Former head of the Eastern package laboratories of the Hinde and Dauch Paper Company, *Fred Wohlers,* has joined the staff of Container Testing Laboratories, Incorporated. Mr. Wohlers has been elected vice president of the company and will make his office in New York.

BREWER SALES EXECUTIVE OF BULKLEY, DUNTON CO.

Announcement has been made by J. C. Marvin, vice president of Bulkley, Dunton and Company, Incorporated, New York City, that John H. Brewer has been appointed sales executive of the company. Mr. Brewer was previously vice president of the Paper House of New Haven and vice president and general manager of Storrs and Bement of Boston. His connection with these organizations covered twenty years.

Mr. Brewer is well known in the paper and graphic industries, particularly in New England; he began his career in 1919 in the manufacturing department of the American Writing Paper Company. It was in this connection that he gained valuable experience in the production phase of the paper business.

John H. Brewer

Mr Brewer has devoted much of his time to association work. He has served as president of the New England Paper Merchants' Association, vice president of the Boston Trade Association, and vice president of the National Paper Trade association.

◆

▶▶▶ The expansion program undertaken by the Kimberly-Clark Corporation, Neenah, Wisconsin, will be directed by *C. W. Nelson,* chief engineer for the company who has been appointed general manager of the project. Allied appointments made to facilitate the general expansion in progress include the naming of *A. G. Wakeman* as assistant general manager directing his attention to statistical and financial control, and *J. T. Whelan* to the post of acting chief engineer.

ROTARY STEAM JACKETED PUMPS

A high grade Pump proven over a long period of time. Will efficiently handle:

CONCENTRATED BLACK LIQUOR
HOT FILLED ASPHALT
HOT TARS
LUBRICATING OILS
(LIGHT AND HEAVY)
CRUDE OILS
VEGETABLE OILS
PAINTS
ALL OTHER KINDS OF VISCOUS MATERIALS
where steam-jacketing is necessary for smooth operation

Rugged Construction — Smooth and Quiet Operation
High Efficiency Assures Low Power Cost

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ROOFING MACHINERY MFG. CO.
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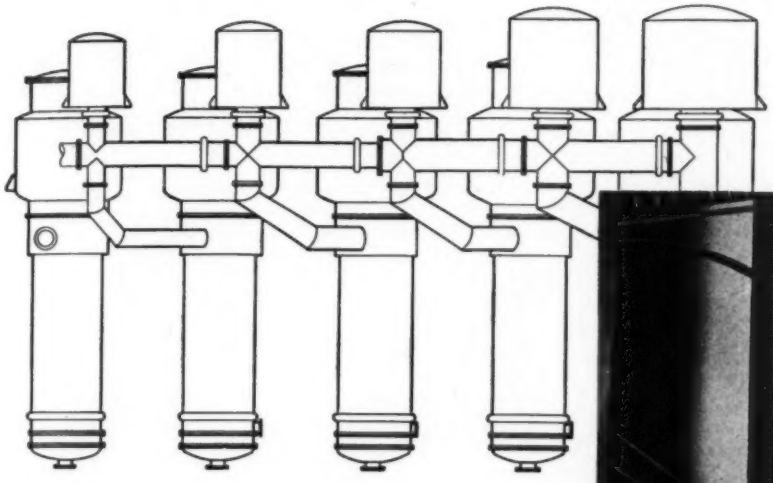

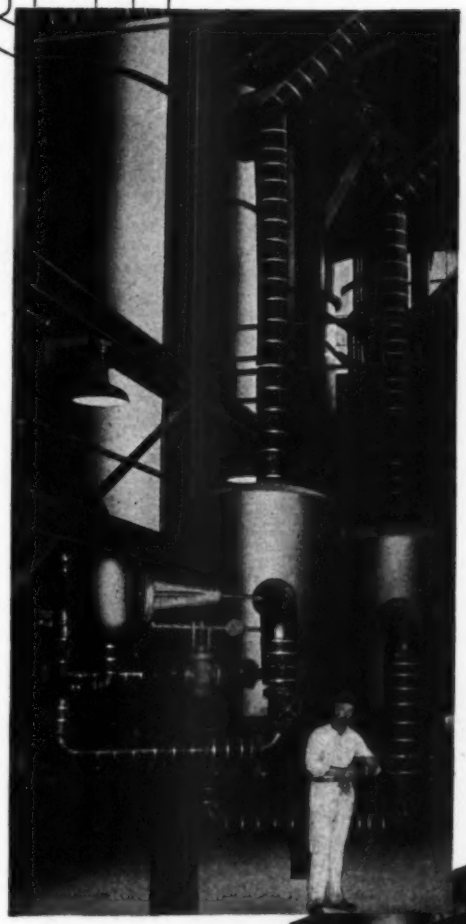

CONTINUOUS "LOW COST" EVAPORATION

At a well-known Pulp Mill, General American Conkey Multiple Effect Evaporators are today demonstrating their economy in continuous low cost evaporation of sulphate black liquor.

Such economy is assured by features of Conkey design — developed by engineers experienced in pulp mill processes — which cut entrainment losses to the minimum, give high heat transfer, and provide entirely automatic control. Dependable operation of the installation is thus insured, and maintenance and supervision requirements are reduced to the minimum.

If you have an evaporation problem involving the concentration of soda and sulphate black liquors or concentration of sulphite mill waste liquors, get in touch with a General American engineer.

EQUIPMENT FOR PULP & PAPER MILLS

Digesters	Thickeners
Blow Tanks	Storage Tanks
Turbo-Mixers	Bins
Filters	Slakers
Kilns	Recausticizing Plants

General American

TRANSPORTATION CORPORATION

process equipment • steel and alloy plate fabrication

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WORKS: Sharon, Pa., East Chicago, Ind.
OFFICES: Chicago, Sharon, Louisville, Orlando, Washington, D. C.
Pittsburgh, St. Louis, Salt Lake City, Cleveland.

GAT X GENERAL AMERICAN

HONORARY DOCTORATE DEGREE CONFERRED ON EVEREST BY NORTHLAND

Outstanding leadership in the field of business administration by D. C. Everest, president of the Marathon Corporation, has won him an honorary doctorate degree from Northland College.

The degree was conferred on Mr. Everest during convocation ceremonies honoring the college war dead held October 5, at Ashland, Wisconsin. President of Northland, Dr. Manley E. MacDonald awarded the degree after Mr. Everest had been presented for recognition by Frank J. Sensenbrenner, president of the University of Wisconsin board of regents and chairman of the Kimberly-Clark board of directors.

◆

ALLEN McKEE BOND NAMED NEW SALES MGR. VOTATOR FATS AND OILS SECTION

Sales manager of the fats and oils section of its Votator Division, is the new appointment given to Allen McKee Bond, Jr., by The Girdler Corporation, Louisville, Kentucky.

Allen McKee Bond

Mr. Bond joined the Votator technical staff on January 1, of this year, and has had an important part in the firm's comprehensive research projects and enlarged engineering service program. He is a member of the American Chemical Society.

◆

▶▶▶ Promotion of *Reginald C. Smith* to the position of contract manager of the Eastern District of the H. K. Ferguson Company, with headquarters in New York City, has been announced by the company. Mr. Smith during the past three years has been project manager in charge of some of Ferguson's larger wartime operations. In his new capacity he will direct the organization's sales efforts in the Eastern states, and will have a leading part in the export sales program of the company.

◆

▶▶▶ Announcement was made recently that *Alan E. Pradt* will be director of advertising for the Rhinelander Paper Company. Rhinelander, Wisconsin. In addition to his new responsibilities, Mr. Pradt will continue to have charge of the company's coated paper sales.

◆

▶▶▶ Research and expert analyst for the American Writing Paper Corporation, *John P. Kennedy*, has resigned. For many years with A. W. P. and former general superintendent of the company's Gill, Riverside, Nonotuck, and Mt. Tom divisions, Mr. Kennedy is well known in the papermaking industry.

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▶▶▶ Chief chemist for the Chemical Paper Manufacturing Company, Holyoke, Massachusetts, is *Freeman Perry*, of Manchester, Connecticut, who is a graduate of McGill University, Montreal, and former chemist for Lydall & Goulds of Manchester.

◆

COL. WM. A. KELLEY TO ASSIST ROBINSON IN WAR ASSETS ADMIN.

Appointment of Colonel William A. Kelley, Milwaukee, Wisconsin, as special assistant to Clinton F. Robinson, vice administrator of the War Assets Administration has been announced.

Colonel Kelley is well known in the paper and electrical equipment manufacturing industries having been the inventor of paper mill machines, including the supercalender drive, a paper machine drive, and an automatic beater.

Before entering the Armed Services, Colonel Kelley was a member of the Reliance Electric & Engineering Company of Cleveland, Ohio, and he was associated with E. D. Jones & Sons, Pittsfield, Massachusetts.

◆

▶▶▶ The newly created position of technical service engineer in the American Standards Association will be taken over by *Eugene Somoff*. In handling the new job, Mr. Somoff brings with him a variety of engineering experience gained both here and abroad. He will conduct world wide surveys of standards available in any particular field for use by ASA committees.

NECROLOGY

ALBERT W. HARRIS

Widely known in the pulp and paper manufacturing industry and holder of numerous patents on paper mill machinery, Albert W. Harris, former president of the Harris Importing and Exporting Company, passed away recently at his home in Glens Falls, New York.

Mr. Harris was the grandson of Albert T. Harris, founder of the Glens Falls Paper Company which later became the International Paper Company. During his career in the paper industry, Mr. Harris has been connected with the International Paper Company, Sir William Price of Canada, and the Laurentide Paper Company of Grand Mere, Canada.

In 1918, Mr. Harris formed the Harris Importing and Exporting Company, Incorporated. He headed the corporation which imported paper machinery, wires, and felts from France, Sweden, and Germany. Mr. Harris ended his association with the import and export business in 1932.

He is survived by his widow and a son.

◆

JOSEPH H. FINN

Chairman of the advertising firm of Reincke, Meyer & Finn, Joseph H. Finn, passed away October 18.

Mr. Finn began his career as a newspaper man in 1894 and entered the advertising business in 1908 when he formed his own company. He specialized in railroad advertising and public relations activities. During his professional career, he has written several trade books and has been a frequent contributor to publications in the sales and advertising fields.

Surviving Mr. Finn are his widow, two sons, and two daughters.

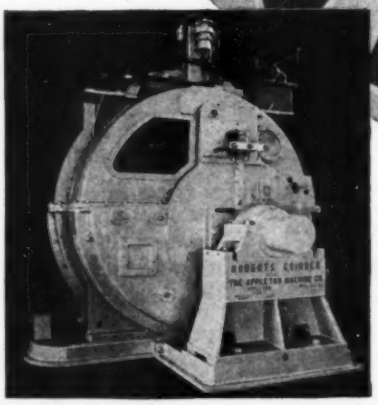
◆

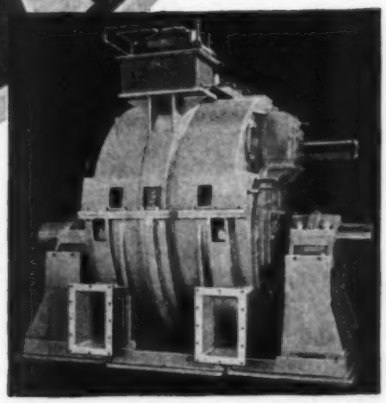
▶▶▶ *Paul Teas*, president Paul Teas, Inc., advertising, Cleveland, passed away October 6 at the age of 61.

◆

▶▶▶ Scientific consultant for Rayonier, Incorporated, and the Crown Zellerbach Corporation for the past twelve years, *Harold Watson Nightingale*, passed away October 20, in Seattle, Washington. Mr. Nightingale taught at the Massachusetts Institute of Technology and the University of Washington. For several years he was engaged in sanitary inspection work for the Washington State Department of Health.

ROBERTS GRINDER





CONTINUOUS HIGH-SPEED GRINDING

LOOK at the illustration of the inside of a Roberts Grinder. It shows the application of the wood and the operating principle responsible for continuous, high-speed, large capacity production. The pulpwood is drawn into the diminishing wedge of the feed pocket by the rotating ring and forced against the stone at a predetermined pressure to be ground into pulp. The speed of the ring can be controlled to create varying pressures resulting in different rates of grinding for the various grades of pulp. The power input governs the speed of the stone and so determines the pulping capacity. Grinding at surface speeds of 5000 feet per minute using up to 3000 H.P. with an output of 50 tons of pulp or more in 24 hours is possible and practicable with the Roberts Grinder. Here is continuous, high-speed production for the modern ground-wood mill, greater pulp tonnage in less time, at lower cost.

THE APPLETON MACHINE COMPANY

APPLETON • WISCONSIN • *Eastern Sales Representatives: CASTLE & OVERTON, Inc., 630 Fifth Avenue, New York*

Look to LUNKENHEIMER *for* STEEL VALVES

2500-lb. S. P. Alloy Steel Gate Valve, with all-welded By-pass, welded in Seat Rings, Seal Welded Bonnet with Breech Lock, Welding Ends, Bevel Gear Drive.

. . . This Mark is Your Assurance of Highest Quality!

● Long skilled in the manufacture of valves and ever responsive to industry's needs, Lunkenheimer pioneered in the development of Steel Valves.

With the application of higher and higher temperatures and pressures, operating conditions became increasingly severe. Lunkenheimer was ready with valves fabricated from materials that met the most exacting requirements.

And as new problems arise, Lunkenheimer metallurgical research, engineering knowledge and specialized manufacturing facilities can be depended upon to aid in their satisfactory solution.

SEE YOUR LUNKENHEIMER DISTRIBUTOR FOR BETTER VALVE SERVICE

Lunkenheimer manufactures a complete line of Bronze, Iron, and Steel Valves, Boiler Mountings, Lubricating Devices and Air Devices. Available from Distributors located in all industrial centers. There is one near you, fully equipped to assist with your (MRO) maintenance, repair and operating problems.

AT THE POWER SHOW — BOOTH 52

See the latest Lunkenheimer design of 1500-lb. S. P. Steel Breech Lock Gate Valves with Seal Welded Bonnet

In Attendance: FRANK P. RHAME, President; HARRY A. BURDORF, Vice-President in Charge of Sales; WM. CARSON, Sales Engineer; FRED H. HEHEMANN, Chief Engineer; JOHN W. BOLTON, Chief Metallurgist; ALLEN W. LANDER, Eastern Sales Manager; WM. J. ANGERT, Manager, New York Branch.

THE LUNKENHEIMER CO., Cincinnati 14, Ohio

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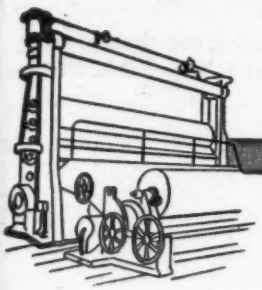
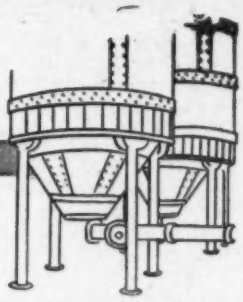


Practical SHORTS



Readers are invited to submit short, practical articles for this department The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Aids to Aligning Parts in Welding Procedures

The usual practice in preparing the edges of broken cast iron parts for welding is to bevel each piece to form a vee when placed together. However, if a narrow "land" is left unbeveled at the sides of each fractured piece, as shown in Figure 1, it will be much easier to line up the pieces for tack-welding. These unbevelled spots can be melted and refused during the welding operation.

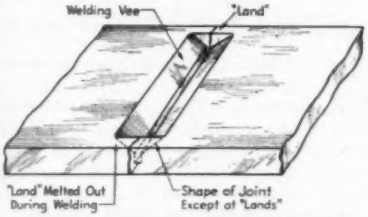


Fig. 1—This sketch shows how joints may be prepared for welding with "lands" left at each side to aid in alignment

Frequently the simple method just described to assure correct alignment cannot be used because of the shape of the part to be welded. Figure 2 shows how an automobile jack and some chain were used to obtain exact alignment in the repair of a hoisting engine cylinder. After the edges had been prepared, the section was tack-welded in place and then the jack and chain arrangement was used for the final adjustment. Blocking would not have been satisfactory for this job because the cylinder had to be moved in and out of a preheating furnace.

Adjustable clamps and C-clamps are often convenient for welding parts for tack-welding, as shown in Figure 3. A handy method for holding small pieces while tacking is to tack the piece to the end of a welding rod first so that it will be possible to keep your hand away from the flame.—THE LINDE AIR PRODUCTS COMPANY.

◆

Color Code for Lubrication of Machinery

The American Standards Association published during 1945 a color code to facilitate the application of the proper type of lubricant to machinery. The code, designated as Color Code for Lubrication of Machinery and numbered as Z47.1-1945, recommends the use of a series of identification colors, supplemented by identification numbers, applicable to: (a) lubrication fittings used on parts or sub-assemblies of machines or other mechanical devices, and (b) lubricant containers and lubricating devices.

The identification colors are assigned to eight general classes or basic types of lubricants. Each color is intended to designate a general class of lubricant, but not any specific grade, quality or brand.

The accompanying table lists identification colors of five general classes of oil and three general classes of greases. Where more than one kind of lubricant belonging to the same general class is used, the Code recommends that the user establish its own system of identifying the individual lubricants in that class by giving each of them a number and by marking this number on the color used for the identification of the class.

◆

Placing Concrete

No element in the entire cycle of concrete production requires more care than the final operation of placing concrete at the ultimate point of deposit. Before placing concrete, all debris and ice should be

Table 1—Identification Colors for Classes of Lubricants*

	Class of Lubricant	Identification Color	Munsell Color Notation
Oils	General Purpose Oils	brown	YR 4/8
	Machine Tool Spindle Oils	yellow green	GY 7/10
	Gear Oils	purple	P 6/8
	Hydraulic Oils	yellow	Y 8/10
	Special Purpose Oils	red	R 5/10
Greases	General Purpose Greases	light blue	B 7/6
	Anti-Friction Bearing Greases	orange	YR 7/10
	Special Purpose Greases	pink	RP 7/8

*If necessary, put the class identification color mark on a light-gray background (Munsell color notation N7/), see 2.3 of this Code.

Fig. 2—An automobile jack and chains were used to hold the parts of this broken hoisting engine cylinder during the welding operation

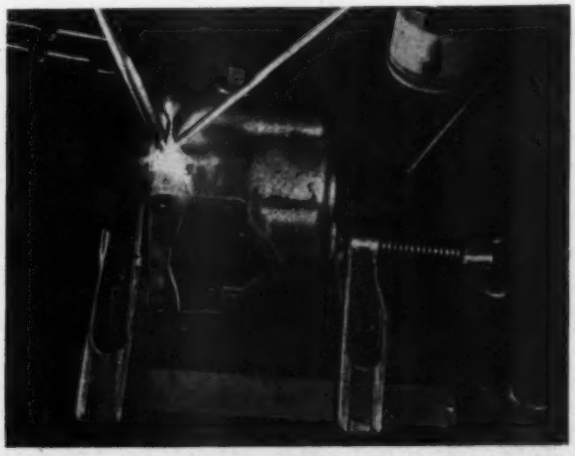


Fig. 3—An adjustable clamp is convenient for holding parts for tack-welding

removed from the places to be occupied by the concrete and the forms should be thoroughly wetted (except in freezing weather) or oiled. Temporary openings should be provided where necessary to facilitate cleaning and inspection immediately before depositing concrete. These should be so placed that excess water used in flushing drains off.

With a well-designed mixture delivered with proper consistency and without segregation, placing of concrete is greatly simplified; but even in this case care must be exercised to further prevent segregation and to see that the material flows properly into the corners and angles of forms and around the reinforcement. Constant supervision is essential to insure such complete filling of the form and to prevent the rather common practice of depositing continuously at one point, allowing the material to flow to distant points. Flowing over long distances will cause segregation especially of the water and fines from the rest of the mass. An excessive amount of tamping or puddling in the forms will also cause the materials to separate. When the concrete is properly proportioned the entrained air will escape and the mass will be thoroughly consolidated with very little puddling. Light spading of the concrete next to the forms will prevent honeycombing and make surface finishing easier.

In placing concrete in deep layers a gradual increase in the water content of the upper portion is quite certain to result from the increased pressure on the lower portions. The excess water should be worked to a low point, without actually causing a flow, and removed. It should be remembered that excess water in the upper layer is just as objectionable as excess mixing water.

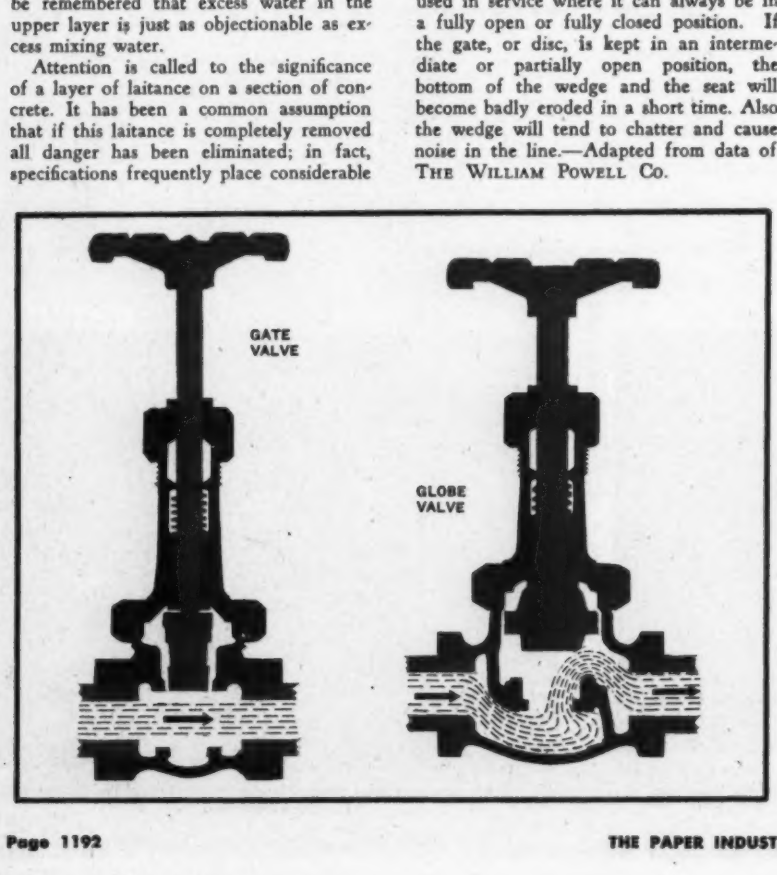
Attention is called to the significance of a layer of laitance on a section of concrete. It has been a common assumption that if this laitance is completely removed all danger has been eliminated; in fact, specifications frequently place considerable stress on its removal. Laitance, however, can only form from the presence of excess water, which means that the upper portion of the concrete will be porous, and the removal of a small layer of laitance still leaves several inches of porous concrete through which water will pass even under moderate pressure. The effect of this porous layer at the top of each day's work can be seen in many structures subject to water pressure. The lower portion of the layer is found to be hard and dense while the upper portion shows efflorescence due to passage of water.—PORTLAND CEMENT ASSOCIATION.

◆

When to Install a Gate Valve

A gate valve should be used whenever pressure drop is to be avoided. The full areas through the body of a gate valve offer no impediment or excessive friction to restrict the free passage of the media.

However, a gate valve should only be used in service where it can always be in a fully open or fully closed position. If the gate, or disc, is kept in an intermediate or partially open position, the bottom of the wedge and the seat will become badly eroded in a short time. Also the wedge will tend to chatter and cause noise in the line.—Adapted from data of THE WILLIAM POWELL CO.



Assembling Small Diameter Copper Tubes with S.A.E. Fittings

The following procedure illustrates a simple and satisfactory method for assembling small diameter tubes (up to 5/8 in. O.D.) with S.A.E. fittings (Figure 1).

Determine beforehand the length of tubing required and uncoil only that amount. This practice will prevent work-hardening of the tube which results from frequent uncoiling and recoiling. To uncoil the length required without kinks or undue waves, place the palm of the hand on the end of the outside coil, holding it firmly against the cleared bench or floor. Unroll the coil with the other hand as illustrated in (Figure 2), following up the straight length with the palm of the hand as required. The uncoiled section will be free of kinks and surprisingly straight. Stepping on tubing to hold it while uncoiling should be avoided.

For small diameter tubing, a disc cutter is preferable. It has the advantages of accuracy, cleanliness and speed, and eliminates the danger of introducing chips into the tube. Cuts are square and clean and require a minimum of preparation for flaring. If it is necessary to use a hacksaw, the blades should preferably have 32 teeth to the inch, and the vise should be of the type especially made for tubing and having a saw guide. The cutting wheel of the disc cutter should always be sharp; being of only nominal cost, it can be replaced occasionally. The tubing should be cut dry to avoid contamination of the inside, and the cutting wheel fed at the rate of approximately one-eighth to one-quarter turn of the lead screw for each revolution of the cutting tool around the tube. Feeding the cutting disc too fast (Figure 3) will tend to squash the tube out of round, taper the end, and leave a heavy burr, especially when the cutter is breaking through the tube wall.

The burr on the inside of the tube should be reamed with a file, triangular scraper, or the reaming blade on the disc cutter. If the tube has been cut with a hacksaw but without a saw guide, the end of the tube should be filed square. If a saw guide or disc cutter has been used, this will not be necessary. Burrs on the outside edge of the tube should also be removed—holding the end downward (Figure 4) during the reaming and filing operations so that chips or filings cannot fall inside the tube. Check the interior of the tube for cleanliness before flaring.

Because of the ductility and uniformly soft anneal of copper tubes, bends of moderate radius on the smaller size tubes can be made readily without the aid of bending fixtures or tools. To make a hand bend, hold the tube in the palm of the hand with thumbs partly extended and about four inches apart, as illustrated in (Figure 5). As the radius decreases, slide the thumbs toward each other, using them as a fulcrum and applying pressure to the bend slowly (Figure 6). Bends much greater than 90 degrees should not be attempted by hand unless the radius is sufficiently large. Bent tubing can also be straightened in the foregoing manner.

A bending spring is a convenient and inexpensive accessory and tends to prevent

tubing from going out-of-round while being bent (Figure 7). The bend is made with either inside or outside bending spring in essentially the same manner as a hand bend. (A separate spring is required for each size tube.) A spring bend should be made slightly beyond the desired radius; reversing the bend slightly will relieve the surface tension and the spring will then slip off or out of the tube easily. An inside bending spring should be perfectly clean and dry and provided with a stop to prevent its sliding into the tube.

Fig. 1—A full-formed flare and the completed joint ready for assembly
Fig. 2—Start with the outside coil of tubing
Fig. 3—Feed the cutting wheel slowly
Fig. 4—Hold the tube downward while reaming
Fig. 5—Start a hand bend this way
Fig. 6—As bend increases, slide the thumbs together
Fig. 7—A bending spring helps prevent kinks
Fig. 8—Bending tools produce uniform bends
Fig. 9—For best results, measure protruding tube
Fig. 10—Flare the tube solidly against the block

When using an outside bending spring, the tube should be correctly marked for positioning of the spring, as the center mark of the bend on the tube will be concealed during the bending operation.

Where a number of uniform bends are required for appearance, or where bends of unusually small radius on larger size tubes are to be made, a bending fixture can be used to advantage. There are available a number of satisfactory bending tools designed especially for copper tubes. The one illustrated in Figure 8 is a portable model; others can be fixed to the bench for shop use.

The most satisfactory flares on small diameter copper tubes are made with a flare block and a yoke-type, screw-feed flaring tool. The most commonly used flare block accommodates from 1/8" to 5/8" tubing. Flares on larger size tubes are usually made with a flanging tool. To flare with a block, slip the sleeve-nut section of the fitting over the tube. The tube end to be flared (Figure 9) should protrude beyond the face of the flare block from 1/16" to 1/8" (1/8" will produce a full flare on ½" tube). Tighten the thumb screws on either end of the block securely. The serrated jaws of the flare block will keep the tube from slipping while pressure is being applied with the flaring tool. Lubricate the cleaned surface of the flaring tool with a drop of oil, slip it over the block and center it in the tube, and, as illustrated (in Figure 10), turn the lead screw until the flared section of the tube is seated solidly against the countersunk recess in the flare block. After dismantling the tube from the block, inspect both surfaces of the flare for splits, cracks, or other imperfections. If the foregoing procedure is followed and high-grade, uniformly soft copper tubing is used, no difficulty should be encountered.—The American Brass Company.

Blueprint Description of Port Wentworth (Ga.) Mill

D. G. MOON, Cons. Engineer
J. E. Sirrine & Company

▶▶▶ THE LOCATION selected by Southern Paperboard Corporation for its new mill is seven miles northwest of the city of Savannah at Port Wentworth, in Chatham County, Georgia, on a tract of land facing the Savannah River and adjacent to the Southern Coastal Highway No. 17. This tract comprises approximately one hundred sixty acres, of which seventy-seven acres will be fenced in for the mill and its facilities.

Rail service will be available from the Savannah and Atlanta Railway which connects with all the other lines in Savannah; and a dock is to be built to give deep water shipment of finished products, as well as receipt of incoming materials such as wood, oil, and chemicals.

Process water for the mill will be furnished from the new filter plant to be built by the Savannah Industrial and Domestic Water Supply System, which is to furnish the board mill with a minimum of ten million gallons per day of clear, soft, potable water.

In general, the mill is designed to produce an average of four hundred fifty tons of liner board and similar products. However, the supporting facilities for the manufacture of pulp, power, and the recovery of chemicals is provided for in such a manner that the full capacity of the two hundred thirty-six inch paper machine to be installed can be ultimately obtained.

Particular attention has been given to the design of the pulp mill and stock preparing facilities. These have been arranged so that different classes of wood may be treated entirely separately throughout and combined into blended furnishes, as desired.

Provision has been included in the design for the later addition of a bleach plant, a second paper machine, and a converting plant for the manufacture of corrugated boxes.

The buildings generally will be of steel frame, concrete foundations, floors, and grade beams, with eight-inch brick curtain walls and corrosion-proof sash, and enclose approximately ten million cubic feet with an area of two hundred sixty thousand square feet.

Roofing will be of precast light concrete slabs, overlaid with insulating board where required. Corrugated asbestos siding will be used for some of the temporary walls, sheds, and in the canopy or open-type construction developed in the design of the recovery, digester, and wash buildings. Foundations will consist of concrete footings on Raymond cast-in-place concrete piles, with spread footings for the lighter loads.

Approximately three thousand piles; thirty-five hundred tons of steel; twelve thousand cubic yards of concrete; and seventy thousand square feet of sash will be required in the buildings and foundations; also about twenty-five miles of pipe will be installed.

The general facilities to be provided for the operation of the mill are as follows:

Wood Preparation and Handling

The woodyard is arranged for the storage of a minimum of fifteen thousand cords received by rail, water, or truck in such a way that the handling into or out of storage will be within the range of locomotive crawler or truck cranes. Provision is also to be made for the handling and cutting into the conventional lengths of long logs.

Five steel conveyors, four of which parallel railroad tracks, and one of which will receive wood brought in by barge, carry the wood to two 12-foot by 45-foot barking drums, the rossed wood from which will be delivered onto a sorting conveyor for the cleaning or rejection and return of unbarked wood, the clean wood being sent to two 88-inch, ten knife chippers, thence through small storage and feeder bins onto a belt conveyor to a ground storage chip bin having twenty-four hour storage capacity.

Each drum with its conveyors, chipper, and screens, is arranged as a separate unit so that, if desired, pine can be run through one line while hardwood is run through the other and segregated in the ground storage bin by suitable partitions.

The ground storage bin will be of steel construction, with large openings on the bottom to prevent arching of the chips. Feeders from these openings will deliver chips onto a belt for distribution of the proper amount of wood into each digester, after passing through a weightometer. In this manner, the wood chips from any section of the bin can be delivered to any of the digesters, as desired.

Bark and sawdust from the yard and wood room operations will be collected onto conveyors and sent through a hog for delivery to a bark burning boiler. Special provision is to be made for cleaning the bark from under the conveyors and for the storage and reclaiming of surplus refuse.

Digesters

For the cooking of the wood chips, six welded steel digesters are to be provided, each having a capacity of over ten tons of pulp per charge. Any of these six digesters can deliver into either of the two blow tanks, so that two classes of cooks with separate woods can be made at the same time.

Full automatic control, as well as manual, will be provided for the delivery of chips, the cooking cycle and the relief discharge, which latter will be condensed for the recovery of turpentine.

The steam discharged from each digester blow will be passed through a separating cyclone and thence through a heat reclaiming system where it will be condensed and used as a medium for heating clean incoming water for wash purposes.

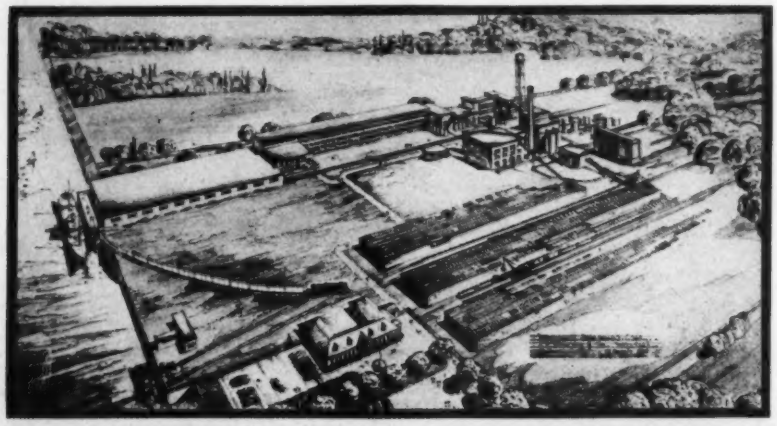
Wash Room

For the de-liquoring of the pulp, two lines of vacuum type washers will be provided. One of these lines will consist of four 8-foot by 14-foot washers, for the removal of liquor from the quick cook or base stock requirements; and the second line will consist of three 8-foot by 12-foot washers for treatment of long cook, hardwoods, etc., as may be desired.

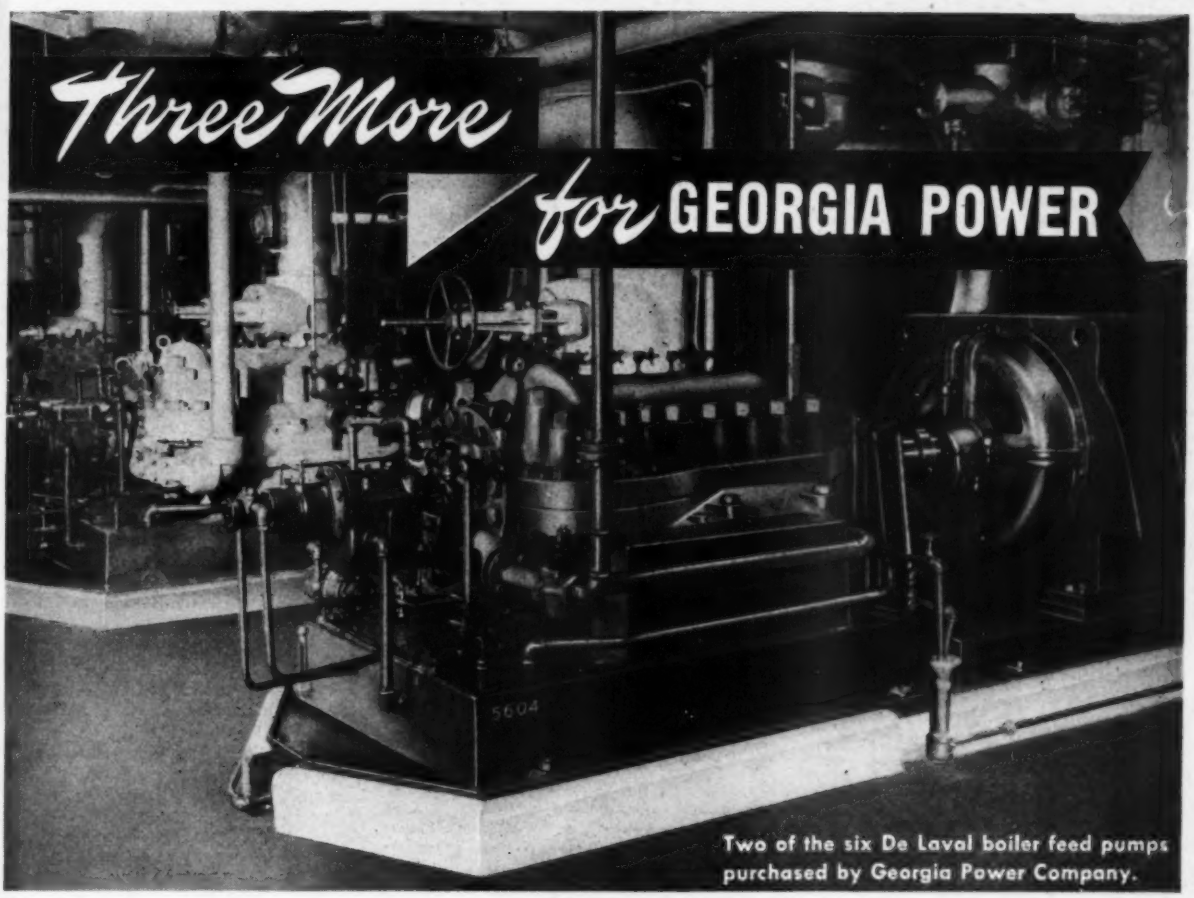
These washers will be set at the same elevation as the digester room floor, with the drop legs carried down to round horizontal tanks extending into and through the wash building, with the various liquor pumps placed under the tanks. Full provision has also been made for the removal of foam and the collection of soap.

Vibrating type pre-knotters are being placed ahead of the washers in order to improve the mat formed on the cylinders, with resulting economy in washing. The rejected knots will be taken by gravity through a small jordan for breaking up and return through the system; any further rejects ultimately coming out with the tailings from the screens.

The washers will be provided with hoods for the removal of vapor and a full complement of automatic control instru-



Perspective drawing of Southern Paperboard's new mill at Port Wentworth, Ga.



Two of the six De Laval boiler feed pumps purchased by Georgia Power Company.

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The satisfactory performance of De Laval pumps in high pressure service is due, among other things, to the rigidity of De Laval solid end head construction, the automatic action of the De Laval hydraulic balancing arrangement, and the leak-minimizing effect of De Laval Labyrinth Wearing Rings.

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ments, including consistency regulation and metering of the incoming stock. For ease of erection and removal of cylinders, a hand-operated crane is to be installed above the washers; and a small elevator will serve the digester and wash room floors.

The final washed stock will be brought by gravity into two separate concrete storage chests each of 15-ton capacity, equipped with propeller type agitators.

While the operating floor of the wash room is to be bricked in and conditioned, canopy construction will be used for the underlying walls.

Screen Room

The two classes of stock from the two washed stock storage chests will be pumped through independent mix tanks, volume meters and consistency regulators to a flow box feeding seven centrifugal screens, arranged so that as many screens as are desired may be apportioned to either stock, with one screen common to the tailings from both.

The final rejects and tailings from these centrifugal screens will flow by gravity through a thickener into a small surge chest, from which they will be pumped through refiners into the liner washed stock chest for recirculation.

The accepted stock from the centrifugal screens will flow by gravity to three 8 by 12-foot vacuum deckers, two of which will thicken the stock for the base liner and deliver by gravity into a screened stock storage chest of 20-ton capacity. The third thickener will be used in conjunction with the second line of washers and screens for delivery into a separate chest, also of 20-ton capacity.

White water from the thickeners will be carried by their drop legs into a concrete storage tank placed under their respective stock chests. Separate white water recirculating pumps will be provided for each line.

Refining

For the final preparation of the stock before going on to the paper machine, fourteen jordans with 400 horsepower motors are to be installed and interconnected to give the maximum of flexibility in respect to the requirements for each grade of pulp.

Normally eight of these jordans will be used for hydrating the base stock and three for the secondary stock, discharging into their respective concrete storage chests, from which they will be pumped through finishing jordans, with two on the base stock and one on the secondary. A separate chest will also be provided for gum or hardwood pulp, with provision for separate refining and final combining of the two pulps ahead of the fan pumps, delivering to the paper machine.

Arrangements for consistency regulation ahead of the jordans and a close control of the latter by instrumentation will be included, with the size and alum received, stored and applied in liquid form.

The refining room building will be served by a 5-ton overhead crane.

Paper Machine

The 236-inch high speed, fourdrinier kraft liner board machine will be of the most modern type and arranged for speeds up to sixteen hundred feet per minute.

The flow box will be a three-pass, streamlined design, with 120-inch slice.

The fourdrinier part will be suitable for a wire 120 feet long and 236 inches wide, arranged for installing a wire from the tending aisle without necessity of removing the fourdrinier proper. The breast roll will be 28 inches in diameter; table rolls, 10½ inches; ten 12-inch suction boxes and a special double box, suction couch roll 44 inches in diameter, having one suction box 7 inches wide and the other 12 inches. There will be included also a secondary head box unit for applying a top film of stock to the base sheet; also the latest type high speed, duplex shake with two units.

For the press part there will be two sections, each with a rubber-covered upper roll 30 inches in diameter, and a rubber-covered lower roll of the suction type 36 inches in diameter, all connected with a pneumatic type loading system to properly distribute weight on the bottom rolls as desired.

The dryer part will be arranged in four sections with twenty 60-inch dryers in each; six 60-inch felt dryers in the first two sections and two similar in the third and fourth; and all journals will be of extra heavy duty, self-aligning rollers.

The driving train will be of the fully-enclosed type with all dryers in the lower tier of each section horizontally connected together by intermediate idler gears which, in turn, drive the upper dryers by means of idler pinions, all arranged for lubrication by a central oil lubricating system.

Following the dryers there will be two stacks of calenders having eight rolls each, with pneumatic type loading system for applying pressure to the journals at the top of the roll. The first stack will be arranged for two water boxes.

Between the two calender stacks there will be three 60-inch diameter calender dryers.

The reel will be of the uniform speed type with 42-inch driving drum and six reeling drums.

For the final rolls, a two-drum, uniform speed winder suitable for taking rolls up to 72 inches in diameter will be provided, of the latest type with antifriction bearings throughout and balanced for speeds up to four thousand feet per minute.

The sections of the machine requiring variable speeds will be driven by a sectionalized individual motor drive having electronic control, the motors for which will obtain their current from two 900-horsepower motor generator sets, with a separate generator for each section of the machine.

The winder drive will be of the regenerative braking type with a 300-horsepower M.G. set and one 150-horsepower motor on each of the winder drums.

Air conditioning and removal of vapor from the machine room will be accomplished by a transite hood over the dryer section, with eleven exhaust fans and two large heater and supply fans providing seventy-five per cent of the total make-up air requirements.

For providing the necessary vacuum on the flat boxes, suction couch, and presses, six vacuum pumps are to be installed aggregating 1125 horsepower.

The fan pump for the base stock of the machine will probably be one of the largest yet installed, having a capacity of forty thousand gallons per minute and will be driven by a variable speed motor. The fan pump for the secondary head box will be for ten thousand gallons per minute.

White water recovered from the paper machine and not recirculated will be returned to the screen room ahead of the pulp thickeners.

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The Paper Industry and Paper World

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Broke from the paper machine will be conveyed to a breaker beater with 64-inch roll for the return as pulp to the base liner machine chest.

A full complement of auxiliaries of the latest type will also be included, such as for the conditioning of felts, removal of condensate, oiling and instrument control.

The machine room building itself, including its extension for roll finishing, will be 630 feet long and 70 feet wide. While it will be built to house a single machine initially, it is so designed that it can be readily expanded for a second machine.

For servicing the paper machine, there will be a main electrically operated crane running the full length of the building, equipped with two 17½-ton trolleys for the handling of the largest rolls to a grinder located in the basement at the dry end of the building. A 15-ton electrically operated crane for the handling of rolls from the reel to the winder and a 5-ton hand-operated crane for the back drive are also included.

Rolls coming off the end of the paper machine will be banded and passed in echelon over a floor scale somewhat wider than the full width of the paper machine. From the scales, the rolls will pass onto a 12-ton elevator, with 24-foot by 10-foot platform, for delivery to the basement and into roll storage by tiering lift trucks. This elevator will also be large enough to take a lift truck and its load from the machine room floor to the basement, if necessary.

Rolls to be rewound will be handled by the main crane to a 100-inch rewinder, the finished rolls from which will return onto the elevator.

The machine shop and storage building will project towards the railroad track from the dry end of the paper machine, and will be provided with a 35-ton trolley crane extending from over the railroad tracks into the machine room so as to give handling of rolls or equipment from cars to the machine room crane for distribution at any point. Auxiliary cranes in the machine shop will also be arranged to pick up materials from the basement floor or from the main 35-ton trolley and service the various machine tools which will be located on the main floor level. The basement under the machine shop will be used for storage and wash room facilities.

The space between the extended fan platform of the machine room and the machine shop will be occupied by air conditioned offices for supervisors, with a maintenance office and drafting room on the upper floor.

Roll Handling

As a continuation from the machine room and the machine shop toward the river, a roll storage building with a capacity for ten thousand tons will be constructed. This building will be 460 feet long on the side paralleling a servicing railroad track in a train shed, and 220 feet wide, with the River end fronting a dock which will be built for a channel depth of 32 feet to take care of deep water shipments down the Savannah River and its terminals.

Recovery of Chemicals

Black liquor recovered from the washing operation is to be stored in two tanks, 30-foot diameter by 32-foot high, and pumped continuously to a sextuplet long tube black liquor evaporator, receiving the liquor at sixteen per cent solids and discharging it at from fifty to fifty-five per cent to concentrated liquor storage tanks, from which it will be pumped through a Cascade type evaporator and finally delivered to the spray nozzles for burning in a modern type black liquor recovery and steam generating unit.

There will be two of these recovery boiler units, each having a capacity for burning 650,000 pounds of solids per day and generating steam at 625 psi, 700 deg., to tie in with that generated by the main boiler plant.

The hot waste gases from the recovery boilers, after passing through the Cascade evaporators, will go through four Cottrell electrical precipitators before entering the stack for the recovery of soda that would normally be carried off in these gases. The dry recovered salt cake from the precipitators will be conveyed to a mixing tank where it will be mixed with either the weak wash from the causticizing plant or weak black liquor and when built up to sufficient concentration will be re-turned into the disc evaporators.

Black liquor soap removed at relatively low concentration from the foam tanks of the black liquor washing operations will be taken off and combined with the feed to the sextuplet steam evaporator and then removed again between the effects of this unit for delivery to a skimming tank where the final soap will be skimmed off and stored for shipment, the excess remaining liquor returning to the evaporators.

Make-up salt cake requirements will be handled by a pneumatic system from railroad cars into storage and the salt cake mixing tanks where it will be combined with black liquor for feeding into the recovery units.

The multi-effect evaporators are to be the self-supporting type and will be placed in the open immediately outside the recovery boiler building so that an automatic control, combined with that for the recovery unit, can all be handled at one centralized point.

The chemicals reduced by the recovery units are delivered in the form of molten smelt into dissolving tanks where they are mixed with recovered weak liquor from the subsequent recausticizing operation required to form green liquor.

The green liquor from the dissolving tanks will be pumped into two storage tanks, each 36-foot diameter by 24-foot high. Before using this green liquor in the causticizing operation it will be clarified in a tray type thickener 35-foot diameter by 24-foot high and the resulting dregs from same further washed for the recovery of soda in a tray, having a classifier for the removal of grits.

The milk of lime from the slaker is to be pumped up to elevated causticizing tanks, 12-foot diameter by 10-foot high, arranged in series and discharging by gravity into a tray type white liquor clarifier, 35-foot diameter by 24-foot high, with the clarified white liquor from this unit returned to two storage tanks, 36-foot diameter by 24-foot high, where it will be available for re-use in the digesters.

The settled mud from the white liquor clarifier will be further washed in a tray type thickener, 35-foot by 24-foot, for the recovery of chemicals and the final resulting sludge delivered into a lime mud storage tank, 20-foot by 20-foot, from which it will be pumped over two 6 by 6 vacuum type mud filters for delivery into an oil fired kiln, 8-foot diameter by 300-foot long, thus giving reburned lime for the major portion of that required in the slaking operation.

The small amount of fresh make-up lime that will be required to replace that lost in the relatively closed system will be handled from railroad cars into a storage tank by pneumatic handling system and delivered into the slaker in conjunction with the reburned lime in automatically measured quantities continuously.

The weak liquors resulting from the various washings in the recausticizing system will be collected and stored in a tank 36-foot diameter by 24-foot high, for re-circulation to the dissolving and other liquor tanks, in conjunction with the black liquor recovery unit.

It is anticipated that the continuous causticizing system will reduce the chemical losses therein to not to exceed 4.5 pounds of soda per ton of pulp produced and also that the long kiln will produce a ton of new lime with not to exceed eight million Btu for fuel consumption. The lime dust carried out by the exit gases from the kilp will also be recovered by

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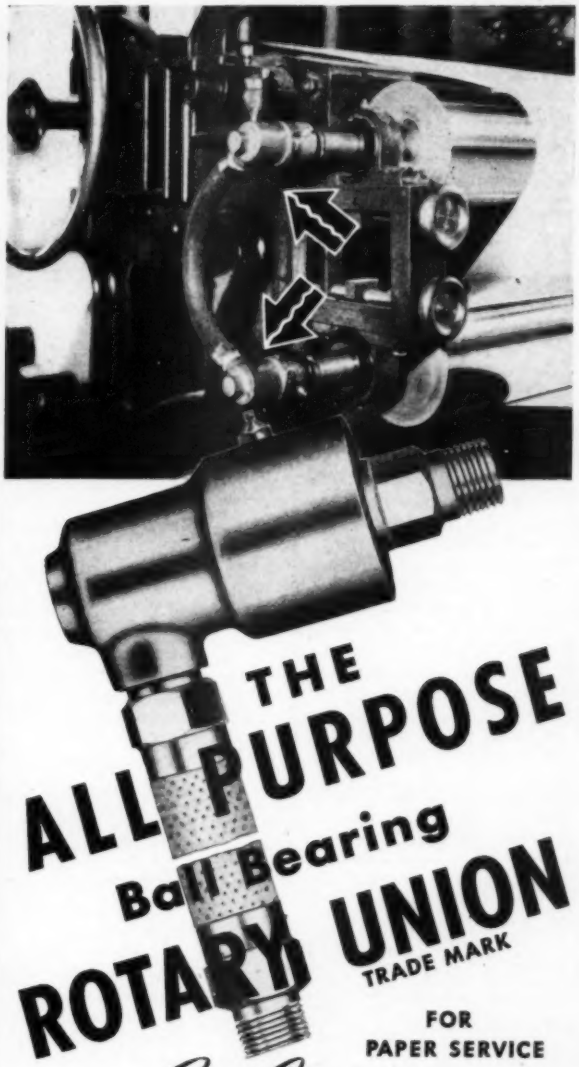

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the wet processes and returned into the system.

The controls for the continuous causticizing operation will be located in an enclosed room near the slaker at about the center of the operations, the balance of the equipment except for the lime mud filters, being in the open.

Power Plant

The power plant is to be divided into three units; that is, boiler room, turbine room, and recovery room. The boiler and turbine room will be adjacent buildings and the recovery room will be a building very near the boiler and turbine room, connected by a passageway in which auxiliary equipment will be located.

The boiler room will have installed in it two oil fired Integral Furnace Power Boilers, each approximately 1,500 horsepower. The third boiler will be a duplicate of the two power boilers but with the addition of a Hofft furnace for burning bark and sawdust. This third boiler will be capable of developing the same amount of steam as the power boilers when using oil alone or firing with a combination of oil and wood refuse. The boilers will operate with steam at the superheater outlet of 625 pounds psi pressure and 700 deg. Fahr. total temperature, with a feed water temperature of 230 deg. Fahr.

Provision has been made for the installation of a fly ash eliminator for the wood refuse burning boiler between the air heater and the induced draft fan.

The burners on all boilers will be of the dual type so designed as to burn either oil or powdered coal. Oil, which is to be used initially, will be delivered by barge to a 12,500 barrel storage tank, 50 ft diameter by 37 ft high and pumped to auxiliary measuring tanks, one near the boiler house and the other near the firing end of the kiln.

All three of these boilers, together with the recovery unit, will discharge their gases into a radial brick stack 250-ft high and 14-ft diameter at the top. This stack will be lighted and marked in accordance with the regulations of the Civil Aeronautics Administration.

In the turbine room there will be installed one 6,000 kw. turbo-generator of the extracting non-condensing type. Steam will be automatically extracted at 150 psi and exhausted at 50 psi. The second turbine of the same capacity, but of the extracting condensing type, will be installed. Steam will be extracted at 50 psi and exhausted to a surface condenser at 27½ in. mercury. These turbines will operate in parallel on the electric end and are designed for 600 psi—675 deg. Fahr. TT steam at the throttle of each.

The condenser will be of the surface type, two-pass and with divided water boxes, and will have a total surface of 7,500 square feet.

Installed also in the turbine room will be two 100 psi motor driven air compressors, each to have a capacity of 542 cfm free air, and to be used to supply air throughout the mill. There will also be installed in the turbine room two 350 psi air compressors, each having a capacity of 300 cfm free air, and will be for use with the recovery "Puff System."

A 600,000-pound per hour horizontal type deaerating heater with vent condenser will be installed in the upper part of the connecting building between the turbine room and recovery room. Underneath this heater there will be installed two centrifugal boiler feed pumps, one electric motor driven and the other steam turbine driven, with the exhaust steam from the turbine discharging into the deaerating feed water heater. The throttle steam for this turbine will be taken from the 150-psi header in the turbine room.

Electrical Distribution

For the 21,000 hp. installed motor capacity, the electrical distribution will be in two voltage level classes. The first or primary system will be 4160 volts, 3 phase, 3 wire, 60 cycle, supplied by the two 6000 kw turbine driven generators. It will serve direct, motors rated 200 hp and larger as well as a number of unit type of substations. The second, or secondary, system will be 480 volt, 3 phase, 60 cycle, supplied by the unit type substations. It will serve motors rated 150 hp. and smaller, as well as form the primary distribution system for building lighting.

The primary distribution will be the radial type, with its control, together with the generator controls, placed in totally enclosed, metal clad switchgear placed in the turbine room and arranged for the outgoing circuits to correspond to the manufacturing departments. Outgoing circuits will radiate from the switchgear to strategically placed control rooms wherein are located the unit type of substations and motor starting equipment.

The transformer and secondary distribution controls will be combined into load center unit substations wherein the transformer and control equipment will be close coupled and all interconnections wholly enclosed.

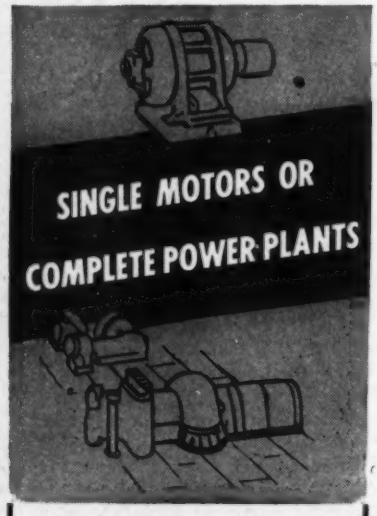
In general, full voltage magnetic starters will be used throughout. Those for the 4,160 volt motors will have oil immersed contacts and will be fitted with high interrupting capacity current limiting fuses, all mounted in self-supporting steel enclosures. The 440 volt motor starters will be the air circuit breaker magnetic combination type, several of which will be grouped together in steel structures known as a motor control center. Both the high voltage and low voltage starters will be placed either in the same rooms with the load center unit substations or in adjacent rooms. Thus all of this equipment will be kept out of the manufacturing areas, will be out of the way, easily accessible for maintenance, will be under control of only authorized persons and fully protected from excessive moisture conditions. Remote control push button stations in watertight cast iron cases will be placed at each machine for the operatives to start and stop the motors.

In effect the low voltage distribution system will consist principally of the circuits from the motor starter to the individual motors, which in addition to others, will have the advantage of reducing to a single motor partial shut-downs caused by trouble that might develop in any one circuit.

Fluorescent lighting will be installed in those areas where conditions permit, otherwise incandescent lighting will be used. The lighting distribution will be 480 volts primary, stepped down to 120/240 volts with small transformers conveniently placed in the manufacturing buildings, and arranged for sub-divided control limited to relatively small areas. In addition to the general lighting system, there will be a "pilot light" system, or "Night Watchman Light" system, controlled from the turbine room which will be for use not only during the non-operating hours of the plant but for emergency lighting in case something should happen to take the turbo generators off the system.

Provisions have been made for connection to an outside source of power, to provide current for maintenance purposes and necessary pumps during the non-operating hours when the turbines would be shut down, and boiler plant under repair.

Wiring in general will be in rigid metallic conduit, installed exposed on the ceilings, walls or under trusses, and in wet areas will be safe-guarded, so far as is practicable, against corrosion. In these areas moisture resistant insulated wires will also be used as a further precaution against trouble developing inside the conduits. To reduce as much as possible work stoppages due to primary circuit failures, each circuit will be designed for two complete circuits in parallel, normally to operate continuously in parallel but each of sufficient capacity to carry the load without injurious heating.



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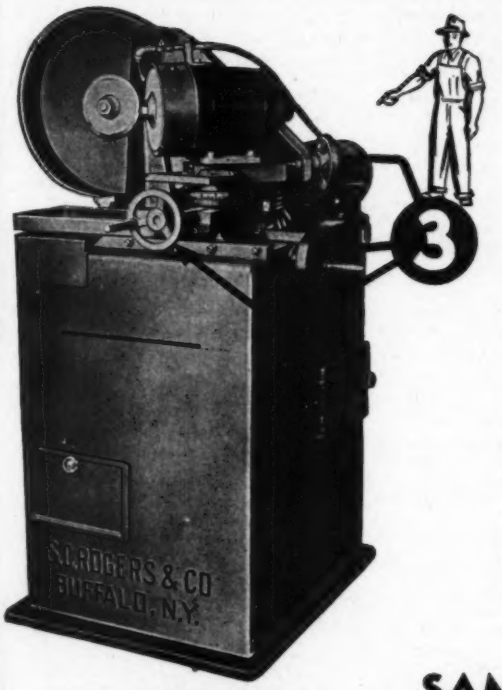

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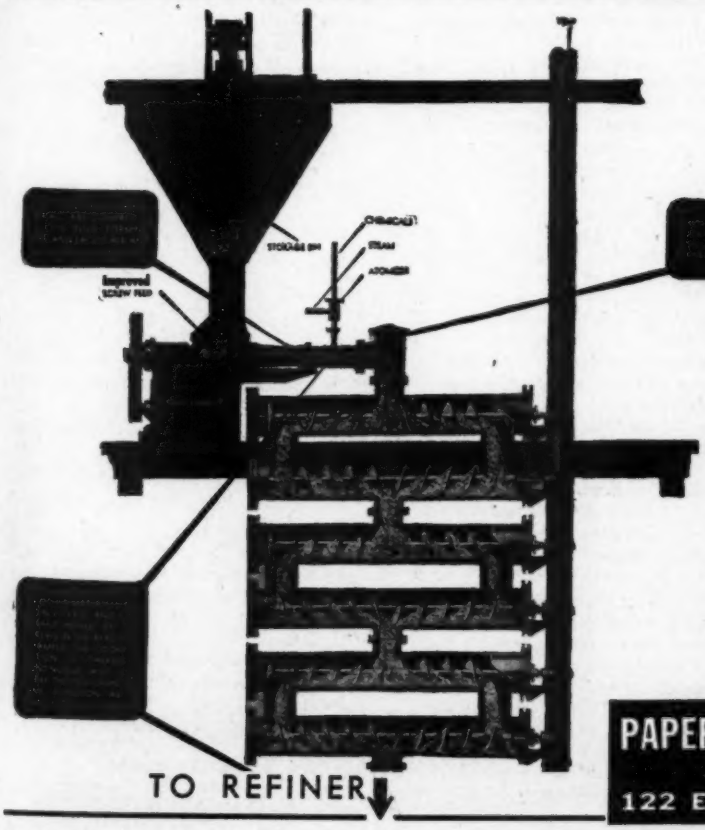

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The fibres and semi-chemical pulps are produced from any species of coniferous and deciduous wood, and the Chemipulper process is especially adapted to the utilization of wood waste, straw, bagasse, and other cellulosic materials.

The Reaction Chamber is made in units and the number of these can be varied according to the degree of treatment required. High pulp yield with low power consumption.

Bulletin upon request.

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Water Supply

Water for the process requirements in the mill is to be delivered through a 20,-inch line at about 50 ft. head from the new filter plant now under construction by the Savannah Industrial and Domestic Water Supply System. Part of this water will be taken initially through the surface condenser of the turbine and then boosted to higher pressures for mill requirements. As this water will be potable, drinking facilities will be provided from the same source in an independent line.

To furnish water for fire protection, evaporator condenser, cleaning of wood, wash-ups, etc., where clean water is not necessarily required a separate pump house is to be built to take water from the Savannah River in which there will be two 1,000 gpm fire pumps, one motor driven and one gasoline engine driven and two 5,000 gpm pumps for the mill requirements.

Waste disposal for the mill will be carried off in two main trunk sewers to the Savannah River, liberal provision being made for general drainage of the area.

A 100,000-gallon elevated water tank is to be provided for the underground loop system of mains in conjunction with the fire pumps, to provide the necessary hose and sprinkler facilities of the mill.

General Facilities

The main office building will contain some 10,000 square feet of floor area and is to be fully air conditioned and treated architecturally in the Williamsburg style. It is to be located on the north side of the property in conjunction with the first aid, clock house, and main entrance gates so that access to the front of the office can be obtained without going inside the fence, although access will be available to employees to the inside from the rear. Liberal parking space for employees' cars, etc., will be provided in the immediate area close to the office.

Liberal locker, wash, and rest rooms, will be provided at strategic points within the mill, as are air conditioned offices for the mill supervisory forces.

A fully equipped laboratory, also air conditioned, will be located at the center of the mill.

Full facilities for automatic call, fire alarm, and telephone systems are to be installed.

Liberal paved roads are being located throughout the mill area, and space is also being provided for the building of a cafeteria and other recreational facilities for employees.

General

The Southern Paperboard Corporation is a subsidiary of Robert Gair Company, Inc., with George E. Dyke, President of the latter as Chairman of the Board; Ernest Rossiter, President; T. Raymond Pierce, Vice-President; T. W. Earle, Vice-President; E. O. Sommer, Comptroller; E. Meyer, Treasurer; W. F. Howell, Secretary; William Bergman, Assistant Comptroller; A. J. Bauser, Assistant Treasurer; and R. B. Trotman, Assistant Secretary.

Mr. Ernest Rossiter as President of the Company has been active for many months in the development of the project, the negotiations required in selecting a site and arranging for construction of the mill, and is now completing a working organization for its operation.

The procurement of wood and management of the woodlands acquired for Southern Paperboard's operations will be handled by another subsidiary, Gair Woodlands Corporation, under the direction of T. W. Earle, President.

Mr. Roland Wilber has been retained as Manager of Manufacturing; H. W. Borman as Assistant to the President; and Charles Mason as Personnel Manager for the Port Wentworth mill, the full organization for which is still in the formulative stage.

The general contract for the construction of the mill has been awarded to the Daniel Construction Company of Greenville, South Carolina. Representing this company on the ground will be James Rice, as Project Manager.

Sub-contracts have been awarded to Raymond Concrete Pile Company; Midwest Piping Company; and the Rollison Engineering Company (electrical sub-contract).

J. E. Sirrine & Company, Engineers of Greenville, South Carolina, and its various departments have been responsible from the inception of the project for the preparation of all reports, selection of equipment, design and detailing of final plans, under the direction of D. G. Moon, head of the Pulp and Paper Mill Division, with the supervision of the active construction in charge of J. W. Cantrell as Resident Engineer.

The construction of the mill at the Port Wentworth site will start with the driving of the first pile the first week in November 1946, and it is anticipated that the mill will be completed and go into operation before the end of the following year.

The estimated cost of the mill exclusive of the cost of the mill site, woodlands and inventory materials, is eleven million dollars.

A partial list of the equipment and material vendors follows.

EQUIPMENT AND MATERIAL VENDORS

Log and Chip Conveyors—Chain Belt Company, Augusta Iron Works.

Weightometer—Merrick Scale Mfg. Co.

Drum Barkers, Digester Blow Down System, Turpentine Condenser — Fibre Making Processes, Inc.

Chippers—D. J. Murray Mfg. Co.

Re-Chippers—Waterville Iron Works.

Chip Screen—Allis-Chalmers Mfg. Co.

Hog for Refuse—Diamond Iron Works, Inc.

Knife Grinder—Bridgeport Safety Emery Wheel Co.

Locomotive Crane—Ohio Locomotive Crane Co.

Truck Crane (Link-Belt)—Bell Lott Road Machinery Co.

Digesters—Chicago Bridge & Iron Co.

Blow Valves—Yarnall-Waring Co.

Blow and Storage Tanks—Ingalls Iron Works.

Black Liquor Washers, Thickeners: Foam Breakers, Knotters: Contrifugal Screens, Agitators—Improved Paper Machinery Corp.

Elevators—Monarch Elevator & Machinery Co.

Knot Grinder—Noble & Wood Machine Co.

Screenings Refiner—Sprout, Waldron & Co.

Speed Reducers—The Falk Corp.

Liquid Alum Tank—O. G. Kelley & Co.

Jordans—E. D. Jones & Sons Co.

Broke Beater—Shartle Bros. Machine Co.

Consistency Regulators—DeZurik Shower Co.

Paper Machine—Pusey & Jones Corp.

Paper Machine Drive—General Electric Co.

Hoods and Fans—J. O. Ross Engineering Corp.

Vacuum Pumps—Nash Engineering Co.

Condensate Return System—Midwest-Fulton Machine Co.

Fan Pumps—Ingersoll-Rand Co.

Stock, Liquor, and Water Pumps—Ingersoll-Rand Co., Worthington Pump & Mach. Corp., Morris Machine Works, The LaBour Co., Inc.

Felt Conditioning—Bird Machine Co.

Scales—Fairbanks, Morse & Co.

Rewinder—Cameron Machine Co.

Roll Grinder—Lobdell Co.

Cranes—Northern Engineering Works, Manning, Maxwell & Moore.

Evaporators—General American Process Equipment Co.

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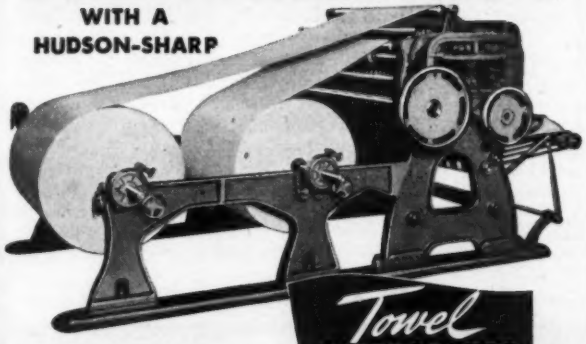

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SMILE WITH *Goulds* PUMPS

This is no time to jeopardize paper production. But sometimes good plans go wrong . . . for want of dependable stock pumps. With stocks containing everything from ground wood, rags, long and short fibres, you need pumps designed for the service. Goulds stock pumps are used in a majority of paper mills for this reason.

Round nose impellers pass solids of different sizes and lengths efficiently. A hand hole on the suction piece permits quick access to the impeller. Should the casing cover be removed, neither suction nor discharge pipes need to be disturbed and that saves precious time.

The vertical pump shown above is capable of performing similar services; also, particularly desirable for installation in congested and low locations.

These and other special stock pump features make Goulds first choice in the industry. They keep paper mill operators happy. Goulds can do the same for you! Send for Bulletin 723.

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Recovery Boilers, Refuse Boilers, and Oil Burning Boilers—Combustion Engineering Co.

Bark Stoker & Bin—The Hofft Co., Inc.

Precipitators—Research Corp.

Salt Cake and Lime Handling Equipment—The Brady Conveyors Corp.

Causticizing System—The Dorr Co.

Lime Kiln—Traylor Engineering & Mfg. Co.

Alum Pumps—Wilfley Pump Co.

Soap Pumps—Viking Pump Co.

Stack — Alphons Custodis ' Chimney Const. Co.

Feed Water Pumps—Goulds Pumps, Inc.

Feed Water Heater—Elliott Co.

Mill Compressors—Sullivan Machinery Co.

Recovery "Puff System" Compressors—Worthington Pump & Mach. Corp.

Fire Pumps—Worthington Pump & Mach. Corp.

Water Intake Screen—Link-Belt Co.

Steam Turbines, Condenser, Motors, and Controls — Westinghouse Electric Corp.

Main Switchgear and Transformers—General Electric Co.

Elevated Water Tank—Chicago Bridge & Iron Co.

Piping—Midwest Piping & Supply Co.

Structural Steel—Ingalls Iron Works.

Conveyor Belting—B. F. Goodrich Co.

Refractories—Harbison-Walker.

Roll Covering—U. S. Rubber Co.

Steel Sheet Piling—Tennessee Coal, Iron & Ry. Co.

Sash—Detroit Steel Products Co.

Paint—Earl Paint Co.

Reinforcing—Hall Steel Co.

Cement—Atlas Portland Cement Co.

Roofing, Tile—Porete Manufacturing Co.

Fencing—Cyclone Fence Co.

Note: Above list covers equipment and material orders placed to October 21, 1946, and covers the major portion of the acquisitions. There remains some equipment yet to purchase; such as instruments, controls, etc., and the names of companies furnishing building material have not all been developed at the date mentioned.

Safety in Relation to Other Management Functions*

JOHN W. MEINHARDT, Director of Safety Gaylord Container Corporation (St. Louis)

▶▶▶ It is amazing what one can learn from a pair of dice. They are probably one of the most universally used devices for amusement. They exert strange fascination for most of us. Why—the only time some people bend down on their knees is when they become involved with these galloping dominoes.

A complete language has sprung up from their use. Such terms as snake eyes—box cars—my baby needs a pair of shoes—echo from the circle of hunching shoulders and popping eyes that follow the gyrations of these provocative cubes.

And what does all this have to do with Safety? More—much more than I can tell.

Let's think of these three cubes in a different light. For our illustration, we'll use three dice instead of two.

This red one we will think of as "Machines"—the green one as "Men"—the black one as "Management."

These are the component parts of every accident.

If we add materials as a fourth dice—we have the component parts of every product. However, we are interested primarily in accidents, so will dispense with the material factor.

Now—if you will think of the spots on the sides of the various cubes as indicative of the effectiveness of these three factors—Machinery—Men and Management, you will begin to see where the honorable game of "craps" has a lot to do with Accident Prevention.

Let's refer to a new machine in A-1 condition—gleaming—well lighted—well lubricated—properly guarded, as tops in equipment, a number one (1) machine.

That worn out, poorly maintained, poorly lighted, unguarded, old buzz-saw, surrounded with dirt and oily floors, we will consider a number six (6) machine.

Inbetween these two extremes there are machines that vary in all characteristics up and down the ladder between one and six—good and bad.

Now let's take a look at this cube representing manpower.

Do you by any chance have in your employ a slovenly, careless, hair-brained worker addicted to drink? Irresponsible—shiftless? Not if you can help it, you don't. Maybe in 1943 you did. At any rate, let's class him as a number six variety.

By now you are way ahead of me. OK—that efficient first-class operator you are thinking about is number one. We need more of him.

Now then—Management.

Even though none of us are blessed with management below class three—we'll have to think of our Foremen—Superintendents—Managers—Presidents—Board of Directors and, if you will, Safety Directors—in terms of classes one—two—three—four—five and six.

From this point on we have to think about these three factors as producing a result. The sum of the dots on the faces of the dice can be considered as evidence of the quality of that result.

Management sets the policy—men push the button and the machines do the work.

I roll the dice and we have either a well planned, well executed, favorable result—or an accident caused by a poorly maintained piece of equipment in the hands of an inept workman, the result unforeseen by inadequate management.

And, of course, we stand a strong chance of obtaining results that lie somewhere inbetween these two extremes.

Here on the screen is a picture (Slide 1)—see page 1208—of a normal distribution of the results obtained through continuous rolling of three dice.

Notice that there is an equal chance of results totaling 18 and 3. There is a balanced set of results around the average, 10½ product. With this particular set of Machines—Men and Management, this is a true picture of the results we can expect to attain.

Now what can be done to improve the result?—Well, with dice it's a simple matter. You just load them. Increase the chances for number one to come up. Cut down on number six. Or change the spots—

(*) Address given before the Paper and Pulp Section of the National Safety Council at the Thirty-fourth Annual Safety Congress held in Chicago, October 7-11, 1946.

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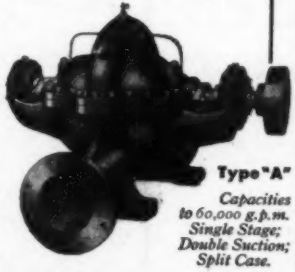

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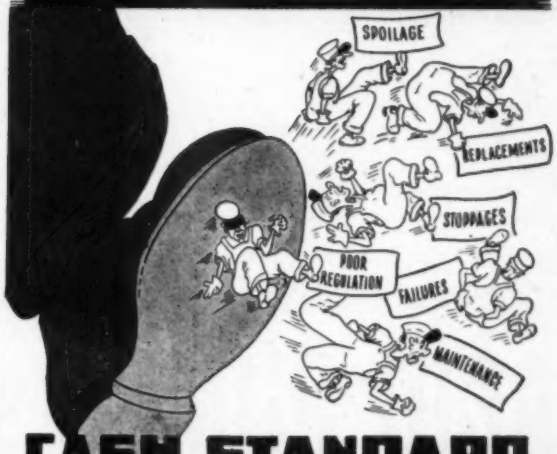

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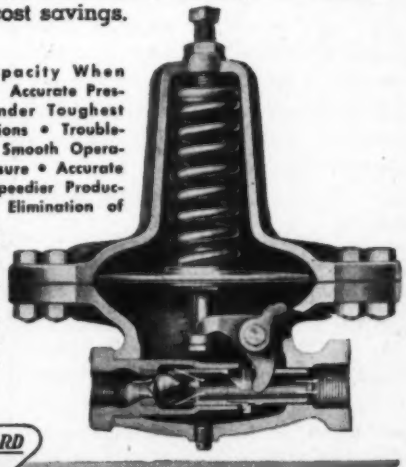

CASH STANDARD CONTROLS.. VALVES

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What would happen if we replaced all the sixes with ones?

Slide 2 tells the whole story. For one thing, no more 18's show up—no 17's or 16's. Instead of only one 3 result, we have eight. Our average has moved down to an 8. As we improved our chances to obtain a better result, that result was obtained.

What significance does all this have with the subject—"Safety in Relation to Other Management Functions?"

It has been my good fortune to review the long term records of a number of geographically well distributed container plants. I have been able to watch not only accident records but—Waste—Efficiency—Labor Turnover and other records.

Through continuous study of these records, it was only natural that their relationship should one day become apparent.

To illustrate, let's take a look at the time charts developed from the available data.

Our first chart (Slide 3) is that of Accident Frequency. Back in 1939—this figure was 13.50. It remained there through 1940 and then started a rapid climb to its apex of 43.40 in 1943.

Nineteen hundred forty-four showed improvement, 1945 slipped back and the first half of 1946 reflects a return to the down trend we all hope to maintain.

Next look at the chart (Slide 4) reflecting production lost through excessive waste of materials. For purposes of comparison, 1939 was taken as a base, and it is assumed that the waste figures for that year represent the ultimate. Following the line, more and more material was wasted through '41 and '42, and the peak reached in 1943. Again we have improvement in 1944—a slip back in 1945, with a return to the down trend for the first half of 1946.

Our next chart (Slide 5) reflects lost production through lowered efficiency. Reduced output per man is another way of saying it, 1939 being the base year is at zero lost production. The year 1941 reversed the trend evident in the first two charts, but then in 1942, 43, 44, 45 and 46, the results follow the same general pattern.

These charts reflect only results. So far we have not looked into possible causes.

I believe there is no question that due to material shortages—equipment overload—inadequate maintenance—machinery was a contributing cause to increased accidents, waste and lowered efficiency. Unfortunately I was unable to develop reliable records on machine condition.

However, it has been possible to chart an indicator of the other two factors involved—namely, Men and Management. This index is Labor Turnover. Back in the depression years such a thing as Labor Turnover was hardly known. Employees stayed on and on. Changing of jobs was at a minimum, and training new employees an infinitesimal part of the supervisor's job.

A glance at the chart (Slide 6) shows that 1939 was not much of a problem either in that respect. Less than 4 employees per month were hired to maintain an average payroll of 100 workers. Some of the plants involved in this study went entire months without one single new employee to train. Here then is our index to Men and Management. Fewer employees to train meant more time for supervisors to attend to other matters such as Order Scheduling, Waste Control, Quality Control, Costs, Accident Prevention. Fewer new employees meant more experienced employees.

Now let's follow the curve of Labor Turnover. Again we have that characteristic pattern climb to a peak in 1943 when these plants averaged about 13 new men per month to maintain a payroll of 100. To give you an idea how serious this was, it seems only proper to mention that one of the plants involved hired over 100 employees to maintain a payroll of 100 in a single month. Do you think they had problems?

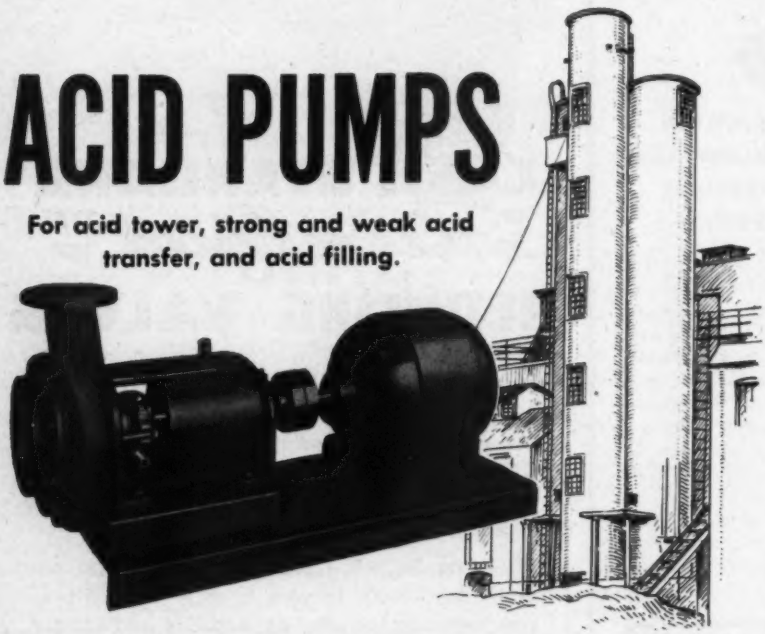
See here, in 1944, where we have the familiar dip—a recession in 1945 and a return to improving conditions evident in the first half of 1946.

Another way to look at these significant relationships is through what is known as a correlation of attributes.

The years are ranked not in date sequence, but in order of the favorable indexes. The best year in waste is ranked 1, second best 2 and so on through the 8 periods studied. Years ranked 1 through 4 are considered favorable or low in waste, and from 5 through 8 high and unfavorable.

ACID PUMPS

For acid tower, strong and weak acid transfer, and acid filling.



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This same procedure is followed on all the data for Accidents—Efficiency and Labor Turnover.

(Slide 7). Waste and Accidents reflect their relationship. Three of the low waste years were three of the low accident years. Three high waste years were also high in accidents. Two years were contradictory. In other words, here is 75% confirmation of the relationship between results from a common set of causes.

Our next chart (Slide 8) correlates Lost Production and Accidents. Here we have 100% confirmation.

(Slide 9). Labor Turnover and Accidents, and again every comparatively favorable year in Turnover reflected favorably in Accident Frequency.

No one is ever completely satisfied with half information. It isn't enough to know how well your golf game went, you keep a score on it, and if you are like I am, you keep track of how many putts you took and how many balls you lost.

So it is with information such as this. We were curious to know how much waste was affected as accidents climbed higher, and how much waste would be saved when accidents were low.

Now—these figures were not being presented as a rule that you can apply directly to every operating plant, but only as a picture of what did occur in these plants and what can generally, and I underline generally, be expected to happen under similar circumstances.

With this bit of warning—here are the charts.

(Slide 10). Here we have charted the per cent of excess waste against the corresponding years Accident Frequency rate. For example—when accident rate was 13.50, excess waste was zero. In another year with accidents at 13.50, waste was .04%.

At the upper right hand side of the chart the point reflects the year in which the Accident Frequency was 43.40 and excess waste over 1.5%. The other points are plotted by the same method.

Assuming that a straight line will represent the relation between these two sets of data, the problem resolves itself into finding that line. We can guess at it or calculate. In either case, it again will represent a condition that generally can be expected to apply.

The line found by use of the method of least squares is apparent on the chart. By observing it's slope, we can say that as accidents increase, material waste increases. In the plants surveyed, when Accident Frequency averaged 40.00 Excess Waste averaged 1.2%. A figure not to be passed over lightly when costs are important, and when are they not?

Now let's check the relation between Lost Production through Lowered Efficiency and Accidents. (Slide 11). Here again it is quite apparent that as we have more accidents we can expect to lose production. When Accident Frequency is at 40.0, our chart tells us we can expect to lose 9% of a plant's output. Add this to the lost production due to waste and 10% has gone out of the window. Does your plant produce 20,000,000 feet each month?—50,000,000? Is 10% of that production worth talking about. I should say it is and, as Accident Prevention Specialists, we should be on very intimate terms with the underlying causes of increased or reduced, if you will, accident tendencies.

Let's take a look at our last Slide (No. 12). While this reflects the relation between Labor Turnover and Accident Frequency, and the relationship appears very definite, any one of a number of headings could be substituted for Labor Turnover.

Remember that increased Labor Turnover means more inexperienced help.

It means increased load on training personnel

—Thinner spread of effective supervision
—Greater employee unrest
—Lowered output
—Increased scrap
—Poorer quality
—Higher costs
—Poorer customer service

The plants involved in this study had basically the same type of safety programs throughout the period of the study. If anything, efforts to curb the rise in Accident Frequency were greater during the war years than before. A glance at the files of correspondence, of plant inspections, of graying hairs clipped from the heads of those of us who went through

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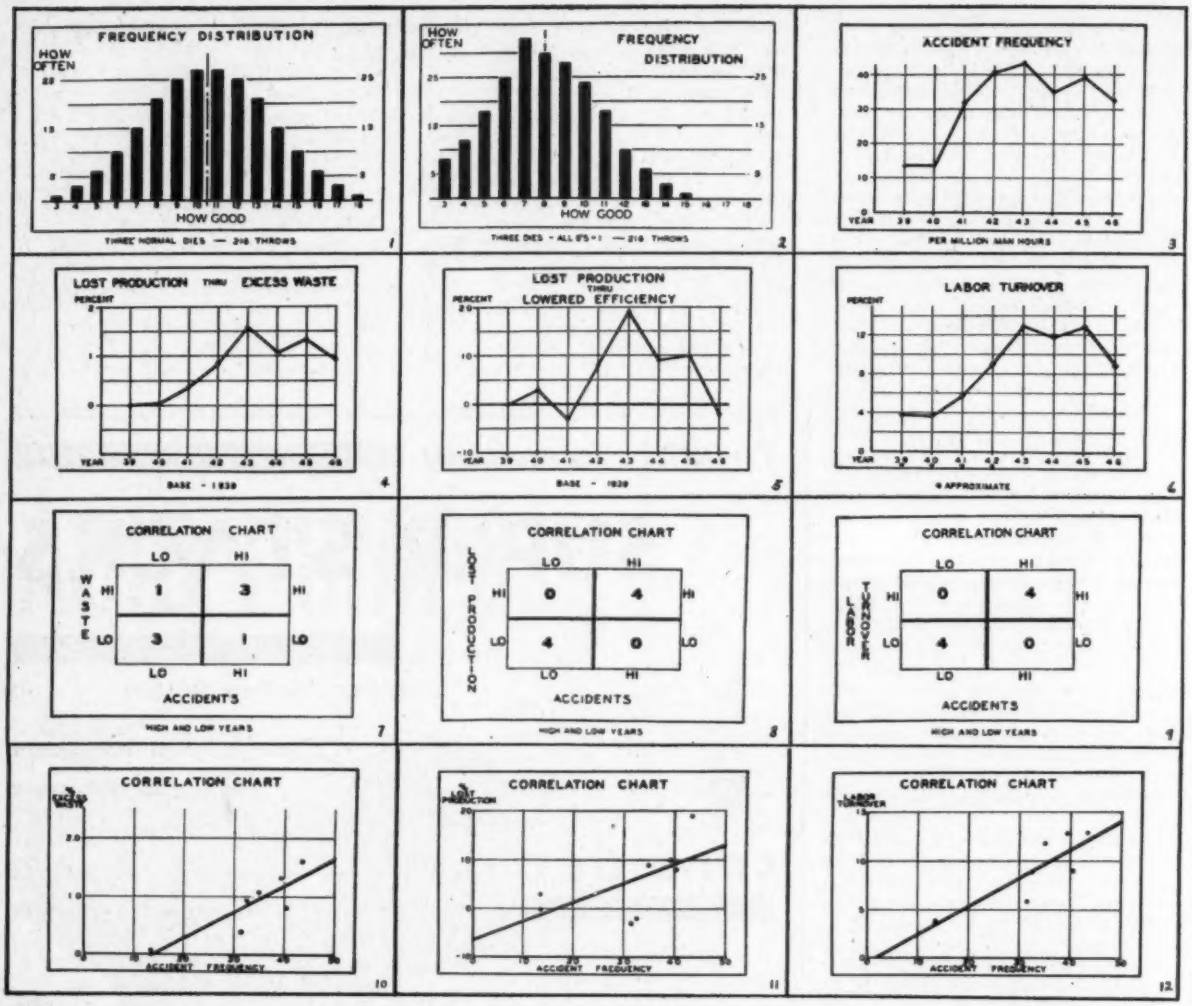


this period certainly reveals more directed effort on this problem.

Yet—accidents went up. How much higher they might have gone without this effort is an open question.

Let's take a look at the component parts of some of the basic management functions. Up to now we have presented data that makes apparent a common set of cause factors through the fact of the common pattern of results.

If we now take some of these management functions apart, there should appear sufficient related activities to make our charted results appear reasonable.

Good housekeeping is a generally recognized essential to really successful operation. Your plant will continue to produce efficiently even though the president or chairman of the board be absent for a month; but just try to operate in the absence of adequate janitor service. What happens?

Loose material and objects accumulate under foot

Loose material and objects accumulate over head

Scrap and waste is not disposed of

Grease, oil and water present a hazard

Unmarked aisles become cluttered with stock

Production is slowed down

Employee earnings are reduced

Morale is affected

Self respecting employees quit

Turnover is increased

Accidents climb

Let's look at Maintenance. In the air forces, poor maintenance has a fatal result.

In a news item dated September 6, 1946, clipped from the St. Louis Star Times, this statement appears. I quote:

"Faulty mechanical work or inspection accounted for 84 of the 129 accidents studied, or 65 per cent of the total.

"Accidents due to maintenance errors rose sharply after V-J Day. From the beginning of 1945 through V-J Day, the rate was 3.2 accidents per 100,000 flying hours. From V-J Day through January, 1946, the rate was 5.4 an increase of approximately 60%. For the month of January alone, the rate soared to 11.2."

Faulty maintenance means:

Rough floors with holes and splinters

Defective tools

Machines out of service

Machines with guards that are out of service

Frequent shutdown of equipment

Lowered production

Dissatisfied customers

Employee earnings reduced

They quit for better jobs elsewhere

Turnover is increased and accidents climb

Planning is a management function that is generally considered as a clerical job. But let's see how it ties in with our problem.

Results of faulty planning are:

Failure to have parts on hand for assembling operations

Cutting off runs prematurely

Accumulation of inventories through inability to complete orders

Slowing up of production

Failure to deliver on time

Dissatisfied customers

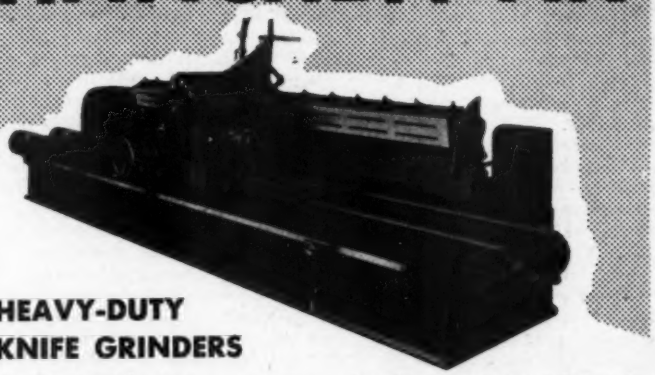
Unnecessary delays affecting employee earnings

Lowered morale, contributing to employee turnover and again—accidents climb.

The control of waste is a vital function of management, and we all know that constant attention is needed to keep it down. Connection between this function and the Safety problem may, at first blush, seem remote despite the fact our charts reflect parallel results.

When we recall this chain of circumstances, the tie-in is definite.

HANCHETT AK



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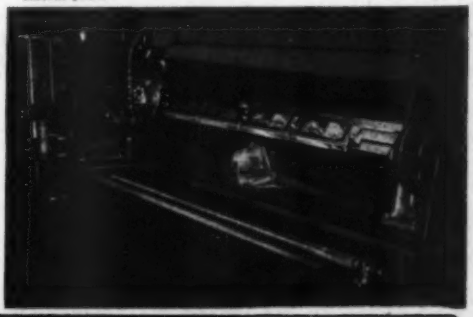

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Increased waste indicates either faulty materials, or faulty operation, or a combination of both.

Faulty operation is the result of faulty equipment or inadequate personnel or both.

Inadequate personnel means insufficient training, probably preceded by poor selection.

In all probability, an employee who has not been properly trained for his job has missed out on proper Safety training, and we know that lack of training in the safe way to do a job, is a short-cut to an accident.

Quality Control, or the manufacture of a high quality product, has a better chance for success when the component parts — Men — Management — Machines —and Materials are of the class one, two or three variety.

It has often been said that in a single plant it is impossible consistently to produce a high quality product and a poor quality product with the same people.

Quality demands that we first have a real appreciation for quality. It requires a taste for good things.

This taste cannot be cultivated among dirty surroundings, under unsafe conditions.

Even a sharp-shooter has difficulty hitting his target if he is kept busy ducking the bullets of the enemy. So it is impossible for a man to do his best work if he is laboring under the fear of injury.

Quality product and hazardous occupation without proper safe guards and training are incompatible.

We are firmly convinced that the tendency to tack on a Safety Program is not a sufficient answer to the accident problems in our high speed industries.

This evidence has been presented with one thought in mind—to strengthen the conviction where it is present and to spread the thought where it has not been present, that:

1. An accident program to be fully successful must be built in, not tacked on, to the entire run of management functions.

2. No management can produce its best results in Quality products—controlled costs—service to customers—responsibility to employees and returns to stockholders without doing an equally good job on Accident Prevention.

Is Safety Your Business?*

WALTER A. CUTTER, Ph.D.
Administrative Assistant
New York University

The time has come for an appraisal of the mission of the men engaged in the work of safety. This seems an appropriate occasion on which to discuss it. Time and the nature of this occasion do not permit a discussion of the manifold problems which you face. Other and more competent speakers will discuss technical questions. This speaker would like to talk about you—and the vocation of safety.

There is something stimulating in talking about a man's calling. What a man is called to is of the utmost importance both to him and to other men. There is a splendid and inspiring statement in the Old Testament[1]: "Seest thou a man diligent in his calling, he shall stand before Kings." What is the "calling" of safety? Are we diligent in it?

There is one general thought about the calling of safety which is worth discussing briefly. This is the viewpoint that as a calling, work in safety compares favorably with other occupations and professions. There are two great forces always at work in the world, the catabolic forces of destruction and the anabolic forces of construction. Some forces, some energies, some men, destroy. Other forces, other energies, other men must oppose such destructive forces and must oppose them with greater strength. Accidents must certainly be classed among the destructive forces. With nearly 1,000,000 persons killed in the United States every decade, with approximately 3,200,000 persons suffering some form of permanent impairment, and economic loss ranging between $3,500,000,000 and $5,000,000,000, we have here a heavy drain on the nation. As front line fighters against this largely preventable human and economic waste, the workers for safety must also be placed in the forefront of all fighters for worthwhile values for all men.

But there are other and more immediately practical considerations to which we should direct our thought. If we wish our calling as men of safety to be highly regarded and to take its rightful place among other professions and occupations, then we muset see to it that our standards and the standards of our performance compare favorably with the work and the men in other lines. Similarly we must have a clear idea of the objective of our work, the training necessary for it and the standards of performance which should be expected. There can be no haziness on these points, if we are to be clear in what we are doing.

The Objective of Safety

The present speaker, in considering these matters has both an advantage and a disadvantage. The disadvantage is that he is not presently actively engaged in the actual performance of safety work. The advantage he enjoys is that as a member of the staff of the Center for Safety Education at New York University, his daily work brings him to direct and constant contact with safety directors and other safety personnel.

Among these varied contacts with men of all degrees of educational and experiential background, there is unanimity on one major point, namely that accidents are bad and should be stopped. There seems to be no general unanimity on such points as these: Where should safety be in an organization? Should it be tied in with production? Personnel? Industrial relations? What should be expected in tangible terms as the result of a safety program? Should the "safety man" throw his weight around, or be unobtrusive and deferential? How much authority should he have? Is there a sound measure of his performance?

It would seem that if safety is our business, there should be some general agreement on such questions as these. The following thoughts are submitted for your consideration as the objective of work in safety, or as we now say more commonly, accident prevention. Men perform many operations, ranging from simple uncomplicated maneuvers to highly complex operations. In these various performances, sometimes there are interruptions or failures which prevent the orderly, and sometimes the successful completion of the operation. Some of such interruptions are called accidents, because they represent unintended and injurious interruptions to successful operations. It is at this point that the safety specialist enters. Insofar as it is the failure of men, machines, or materials which cause accidents, it is his business to analyze the accidents that occur, to determine not the apparent but the real causes of these failures, and on the basis of sound recommendations to see that proper steps are taken to prevent a recurrence.

Obviously, therefore, safety belongs on the main line of activity and not on a siding. Safety is not window dressing. It is in the very nature of things, as integral a part of production, as is any other part of production. Or again, it is not something apart. It is a "part of." This seems very elementary, but it is clear that a great deal of confusion would be avoided, if all safety personnel, and all managements recognized that safety "belongs" and is not a luxury to be indulged when the mood is propitious. How much of the frequently heard argument would be voided, if we were all skilled and resourceful in pointing out to management that safety is an aid to the successful completion of whatever the firm is engaged in doing. On this basis, for a management to oppose safety would be tantamount to opposing the making of products—or, worse yet—profits.

All that safety intends is to so help direct and control the actions of workers to so help control the mechanical and other means of production, the physical surroundings and conditions, that production will not be impeded or stopped by reason of injury. Quite obvious it belongs in with production, or with whatever type of operation characterizes the firm. What a stupid thing to hear a production man or a superintendent of manufacturing say that "safety gets in the way" of production. What a limited comprehension of his own objective if he believes such a thing.

As to the precise place in the plan of organization which safety should occupy, that will vary. A case can be made out for putting it in with personnel. Men have

(*) Address delivered at the opening session of the Paper and Pulp Section, of the Thirty-fourth National Safety Congress and Exposition, held in Chicago, October 7-11, 1946.

(1) "Seest thou a man diligent in his business? He shall stand before kings. . . ." King James Version, Proverbs 22: 29.

most of the accidents. Control them and you will control the accidents. It is certainly true that when men are properly examined, mentally and physically, properly indoctrinated, properly trained for their job, properly assigned and properly supervised, they will have fewer accidents and cause less interruption to production.

Equally good cases can be made for putting safety in with other departments. A strong case can be made for giving it an independent status. In a large sense, it is unimportant just where it is, as long as it is on the main line and as long as everyone sees that the objective of safety is identical with, and part of, the larger objective of the undertaking which is the provision of goods and services for the purpose of making a profit. If safety is our business we should work unremittingly to see that all concerned have this clear insight. We are aids to accomplishment. Other persons share the accomplishment. Our best results come about in a sense when our objective is so well realized that we are not noticed. Safey is seldom attained when by an operation of the "primadonna" complex a safety director tries to make the plant operation a part of his safety program, rather than making his safety program a part of the plant operation. Our business is to see that safety is where it belongs, right on the main line, doing the business of preventing accidents.

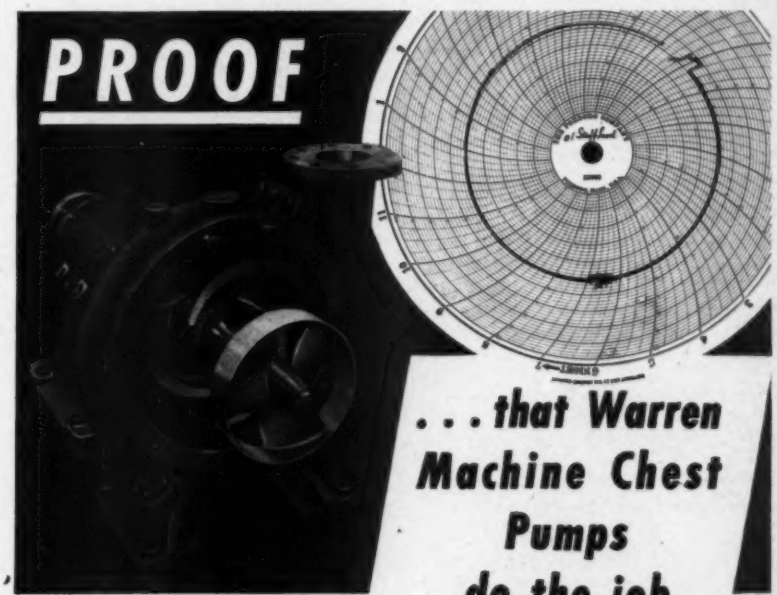
The Training of Men

Safety personnel should illustrate the definition given by Benjamin Franklin for an educated man; they "should know everything about something and something about everything." If safety is our business, then it is our business to examine this whole question of the adequacy of training and the kind of training which men in this field should seek. Men in this field who are connected with industrial operations are commonly called safety engineers. Yet there is at present no recognized degree in safety engineering given by any first rate institution. There are men with engineering degrees who practice safety. There are also outstanding men with little formal education, but a wealth of practical mechanical experience in manufacturing and industrial lines. There are younger men with one or two year's experience, and one or more courses, who are engaged in accident prevention. They are all called indiscriminately "safety engineers." It is quite apparent that this is an unsatisfactory condition. But the remedy is not simple.

This is not the place to discuss in all of its important aspects the whole subject of training. The subject is a large one and one that is receiving widespread study. It is sufficient here to discuss certain fundamentals of this question as they relate to you and hundreds like you. We must go back now to the first major point discussed in this address; namely, the clear objective of safety. Certainly there can be no satisfactory program of training, if we do not know clearly and specifically what we are training for. The broad knowledge advocated earlier is valuable, but it is never so valuable as when it is organized around certain accepted basic principles and channeled into effective working practices.

First we must recognize that there is no single job in safety. There are many. Hence no single type of training can equip a man for these diverse jobs. Certainly there is room in safety for trained engineers. There is also room for trained psychologists, doctors, training specialists, inspectors, chemists. There is an equal amount of room for trained supervisors. There is a special place for the safety directors, whether he be the only individual working, or is the director of a staff. He is the administrator, the co-ordinator. It is not to be expected that he should be an expert in all of the activities he is co-ordinating, but he should know enough about them to do his own work successfully. He sees plainly what the objective of safety is; he sees what specific contribution each of the above persons can make; he knows what a safety program should be and what are the objectives of safety organization. Moreover, and most important, he knows that the only excuse for all of the above mentioned persons and activities, is that their efforts should be skillfully blended together and made a service to orderly and successful production.

Managements in many cases must be blamed for part of the present confusion. In some cases they are not certain what type of person they want, or what he should do, and sometimes they make the



THE chart above, made at the plant of a large paper manufacturer, is positive proof of the constant, uniform delivery of Warren Machine and Jordan Chest Centrifugal Pumps. It shows a 24-hour record of stock level in the regulating box... head in chest varied from 0 to 8 feet, yet practically throughout the entire test, the Warren Machine Chest Pump maintained the regulating box level *constant to a fraction of an inch!*

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mistake of thinking that $2500 a year will buy a medicine man who by some magic formula will solve their "safety" problems. It is another case where only a clear perception of objective will guarantee that the "right" man will be chosen, one whose training matches what he is expected to do.

Thus, the training can be very simply described. A man should have, along with his special preparation, a thorough grounding in the principles and practices of accident prevention. Such grounding should include a great deal of specific training in that knowledge which develops on understanding of people and the conditions under which people work best. Along with this should go a complete knowledge of the plant or industry where the man is working, such knowledge to be qualified by what the man is doing. The knowledge of the operation required by an engineer, or an inspector, or an industrial nurse, or a training specialist will be different, but each is indispensable to the success of the whole—which is successful production.

It may well be that in the future, to get away from some of the confusion that exists, we will stop using the term "safety" in connection with such work, and begin using terms for these varied jobs that will show clearly that their only purpose is to increase and maintain the maximum efficiency. It can be clearly shown, if we know clearly what we are doing, that successful accident prevention is not negative, but a positive contribution to the quality and quantity of production. It doesn't merely *save* something, or *prevent* something; it *adds* something, without which the enterprise cannot be wholly successful.

The Performance of "Safety" Men

Men like to be identified with successful undertakings. The success of a safety director may be something quite difficult to measure. Compare him with the production manager, who produces something, and he may look rather unsatisfactory to some. Yet he produces, as tangibly as any production manager, a quality product. In one sense, his success comes about when "something" doesn't happen. A low frequency and severity rate is one index. Lowered compensation costs are another. Again, this type of evaluation may operate: what would the condition be if the man were not operating.

But over and above all of these, the good "production" health of the whole plant is the reward which comes to the safety director. If the whole enterprise is carried forward with that irreducible minimum of interruption caused by preventable failure, he is successful. It gives us all the greatest satisfaction to note that this success saves not only money and property, but also prevents death and disabling injury to thousands. Here is the case where good business is the best business for society, which means for individuals like you who are sitting here. Leave here then with the consciousness of a job for which you will never be fully prepared, but one whose success is the best success. "Seest thou a man diligent in his calling, he shall stand before kings!"

The Organization and Functioning of the Maintenance Department*

GEORGE H. PRINGLE, Division Engineer
The Mead Corporation (Chillicothe, Ohio)

Paper is one of the few industries where, in a large number of mills, maintenance is under the direct supervision of the general superintendent instead of the plant engineer. In my opinion, this is entirely wrong.

The general superintendent is responsible for the manufacture of pulp and paper and has sufficient production problems without the added responsibility of the maintenance department.

The plant engineer is, in most mills, in charge of engineering, steam power, electric power and new construction. To this should also be added maintenance. All these departments, including maintenance, are utilities or services furnished to the main production units and should come under one supervision.

Directly in charge of maintenance, and reporting to the plant engineer, is the maintenance superintendent.

Working directly under the maintenance superintendent is the master mechanic who should be a qualified practical man not necessarily a graduate engineer.

The master mechanic is directly responsible for the work done by the machine shop, blacksmith shop, welding shop, millwrights, pipe-fitters, carpenters, riggers and painters. Over each of these groups is a foreman reporting to the master mechanic. In some cases, it may be desirable to combine the machine shop, blacksmith shop, and welding shop under the machine shop foreman and the millwrights and riggers under the millwright foreman. One of these foremen, preferably the machine shop or millwright foreman, should be designated as assistant master mechanic and qualified to take charge in the absence of the master mechanic. Similarly, each of the other groups should have a senior, skilled man designated and qualified to take charge in the absence of the foreman.

Instrumentation in the pulp and paper industry has increased very rapidly in recent years, and it has now reached the point where every maintenance organization should have an instrument department. This department should be in charge of an instrument supervisor. This instrument supervisor should report directly to the maintenance superintendent.

Every maintenance organization should have a lubrication department in full control of and responsible for lubrication throughout the entire plant. This department should be in charge of a lubrication supervisor who is directly responsible to the maintenance superintendent.

In the maintenance office there is at least one despatcher, under the direct supervision of the maintenance superintendent. This despatcher takes care of all maintenance work orders, costs, record files, and other necessary clerical work.

For the benefit of the accounting department, stores, as well as the maintenance department, a complete break down of all the equipment in the plant should be made and account numbers allocated to each piece of equipment.

In the maintenance department office files there should be a complete record covering all the plant equipment and filed according to account numbers. This record should contain complete equipment nameplate data, detailed equipment prints, manufacturer and number of all antifriction bearings, "V" belts, detailed specifications of gears, shafting, pumps, etc. There should also be a cross index of this file showing where duplicate parts are used. This is particularly applicable to antifriction bearings and "V" belts and will reduce the spares necessary to be carried to stores.

In addition to this record, it may be advisable to keep a separate card index file on pumps, reduction gears, anti-friction bearings and "V" belts for ready reference.

Maintenance work orders should be the duplicate type and should show account numbers and specify clearly the work to be done and when required. These work orders are made out by the superintendent or foreman in the department where the work is to be done and given to the despatcher in the maintenance office. These open orders are kept in racks in the maintenance office according to departments and, at any time, the superintendent, master mechanic or foremen can tell the work ahead of any maintenance group by referring to these orders.

(*) Abridged from paper presented at the TAPPI Engineering Conference held in Milwaukee, Wis., October 2-4, 1946.

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On shut-down work the management should insist that no maintenance orders are to be received after Friday noon prior to a Sunday shut-down except absolute emergencies. This will give the maintenance supervisors sufficient time to check all their shut-down work, materials required, and schedule their men so that there will be a minimum of lost time during the shut-down period.

The despatcher keeps a record of each man's time on each work order and when the job is completed obtains the material costs from stores and shows on the work order a total cost for the job. All completed work orders should be given to the maintenance superintendent who should check, on the job, the work done and the costs and, if possible, check personally with the supervisor who made out the order. If the work is not satisfactory or the costs are excessive he should call it to the attention of the master mechanic or supervisor and make sure that they in turn notify the workman responsible in the endeavor to improve the efficiency of this department. The maintenance superintendent should add his comments to the work order, initial it, send the original to the department head where the work was done and file the duplicate.

At least once a year the maintenance superintendent should review the maintenance costs of each equipment unit according to account numbers and should also compare these charges against previous years. This comparison will tell him at a glance any piece of equipment on which maintenance charges have been excessive and he can take necessary steps to correct it.

All spare mechanical equipment carried in stores should be clearly tagged. When any of this material is requisitioned by the maintenance department, the storekeeper should refer these tags to the maintenance superintendent for his decision on re-ordering. In this way, the maintenance superintendent has, at all times, full control of the spares carried in stores and the items taken from stores by his department.

Once a day, preferably around 1:30 P.M., there should be a short meeting of the maintenance department supervisory personnel. This meeting should be presided over by the maintenance superintendent and, if at all possible, the plant engineer should attend. At this meeting the work in progress can be discussed and the jobs to be worked on by the various departments the following day arranged. This meeting also provides an opportunity for discussion of any other maintenance problems.

Like all organizations, it is very important that the line of authority be rigidly followed when issuing any instructions. The maintenance superintendent should never issue any orders to the foremen but put them through the master mechanic or supervisors. This same procedure should be strictly adhered to down the line.

No attempt has been made to cover electrical maintenance as it comes under the electrical superintendent and is a separate department working under the plant engineer.

Some Economic Aspects of the Pulpwood Situation*

DR. RUTH SHALLCROSS, Research Associate
The Institute of Paper Chemistry

Before 1960, the paper industry met its consumption requirements largely by utilizing raw materials other than pulpwood. In 1869 only about 2,000 cords of pulpwood were cut domestically, an insignificant part of the furnish of the approximately 400,000 tons of paper consumed in this country. But by the end of the century, pulpwood consumption jumped to two million cords.

Even though wood was plentiful and scarcely touched by the wood pulp companies at that time, the industry imported 18 per cent of its required pulpwood and 5 per cent of its wood pulp. The economic motive for importing in those early days could not have been lack of supply. The imported pulpwood of the particular species desired was cut in foreign countries at less cost to those mills who purchased it than they could obtain it in the United States.

Wood pulp at that time comprised 53 per cent of the consumption of raw materials. Rags made up 11 per cent of

(*) Abridgment of paper presented at the fall meeting of the Technical Association of the Pulp and Paper Industry held in Detroit, Mich., September 26-28, 1946.

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the consumption of fibrous materials, with waste paper supplying 16 per cent, straw 16 per cent, and manila stock 4 per cent.

What pulpwood was used was mined, not grown, and only a very few in the industry thought twice about reforestation or the cultivation of a permanent supply of pulpwood.

From the turn of the century until 1930, we became more and more dependent upon foreign supplies to meet our steadily growing pulpwood requirements for the expanding consumption of paper and paperboard. By 1925, 53 per cent of the pulpwood necessary to meet the total paper demand came from foreign sources. This was principally because the industry was concentrated in the Northeast and Lake states where proximity to the Canadian forests made it easier and more economical to get the preferred species of wood from Canada than to obtain them some distance away in the United States. The paper mills found foreign pulp cheaper for grades desired, relative to the grades which could be obtained here. So imports of wood pulp increased. With newsprint on the duty-free list since 1913, thanks to the American publishers, our imports of paper from that time on increased.

Between 1899 and 1920, the domestic cutting of pulpwood kept pace fairly well with pulpwood imports, both increasing at about the same rate. The use of pulpwood other than spruce and the rapid development of the Pacific Coast industry, as well as the beginning of the use of southern pine, opened up vast United States pulpwood resources which, by the late 'twenties, had turned the industry to domestic sources in larger and larger proportions. The ratio of imported to domestic pulpwood consumed as such in the United States dropped steadily in the late 'twenties and all through the 'thirties. By 1940 we imported only 10 per cent of the total pulpwood consumed by our pulp mills. The opening up of the kraft mills in the south was only partially responsible for this trend. There was also the conscious effort on the part of the Canadians to retain their own timber resources for industrialization in their own country.

The trends apparent in the 'twenties led to the predictions of greater dependency on foreign sources unless conscious effort on the part of the American mills reversed them. Our timber lands near the established pulp mills were becoming more and more depleted of the species of wood most desired. But industry leaders did reverse the trend, largely by the substitution of species, so that now we can look back into the history of the last thirty years and see that pulpwood consumption quadrupled at the same time that pulpwood imports only doubled.

The supply picture during the 'thirties was brighter only because the industry's technicians had found new ways of utilizing the more plentiful species, and because the leaders had made new areas of supply available to the industry. The stands of spruce were not as great as in the 'twenties, when dire predictions were made as to the future supply of raw materials for the pulp and paper industry, predictions, however, which undoubtedly aided in furthering a much needed reforestation program. These pessimistic predictions of the 'twenties could not have taken into account the development of human ingenuity on the part of the industry's leaders in meeting shortages in natural resources by methods now well known to all of you—the methods of utilizing species other than spruce being perhaps the most important.

The trend toward greater dependency upon foreign pulp was not reversed as early as it was for pulpwood. It was not reversed, actually, until 1935, although for a ten-year period between 1925 and 1935 domestic production of pulp kept pace with increases in imports. The United States mills imported approximately 28-29 per cent of their total wood pulp consumption all during that ten-year period. But, by 1940, the percentage had fallen to 12, or a ratio of 7 to 1, which during the war was raised because our government brought considerable pressure to bear on the Canadian Government to supply a larger amount of pulp than might otherwise have been the case.

Imports of paper likewise have failed to retain the importance percentage-wise which was gained in the late 'twenties and early 'thirties, when 19 per cent of our paper consumption was imported. By 1935, the peak level of paper imports began to taper off. Up until that time there had been a steady increase of paper imports since 1909, when the imports amounted only to 1.5 per cent of the 4 million tons consumed. By 1914, 6 per cent of the paper consumed was imported; 11 per cent by 1919; 15 per cent by 1925; and 19 per cent by 1930, where it stayed until 1935 when the impact of southern kraft papers lowered the relation of newsprint to the total paper consumption and, hence, lowered the percentage of paper imported.

Most historical accounts credit the increasing importations to the placing of newsprint on the duty-free list. However that fact alone does not fully explain our growing dependency upon Canada for newsprint. It means that American mills have not been able to lower costs to such an extent that they can successfully compete with the Canadian mills, or those mills set up in Canada and financed by American capital. Wood, power, and labor costs have all been relatively lower for the Canadian newsprint mills than for most of the old newsprint mills in the Northeastern and Lake States. During the war the natural forces of economies have been accentuated by government regulation and more American mills left the production of newsprint to the Canadian mills.

Over the years, the ratio of paper consumed to pulpwood required for that consumption has varied between a low of 96, when fibers other than pulpwood were used in larger proportions than today, and when the method of pulping allowed for more wood pulp from a cord of pulpwood, to a high of 117 in 1945; i.e., for every 100 tons of paper consumed in 1945, it took approximately 117 cords of domestic and foreign pulpwood, not counting the pulpwood represented by the large amounts of waste paper used. It is estimated that this ratio may be reduced in the future probably to 110 or so, because of the trend toward larger uses of groundwood pulp, because of the increased uses of fillers in more papers than previously, and because the hydraulic wood barking and whole log chipping processes have increased in pulp yield. It is even conceivable that the ratio may be lowered still further.

In 1945 the United States consumption of paper and paperboard was nearly 20 million tons, of which 86 per cent, or 17.4 million tons, were domestically produced. The pulpwood required to produce this level of paper and paperboard consump-

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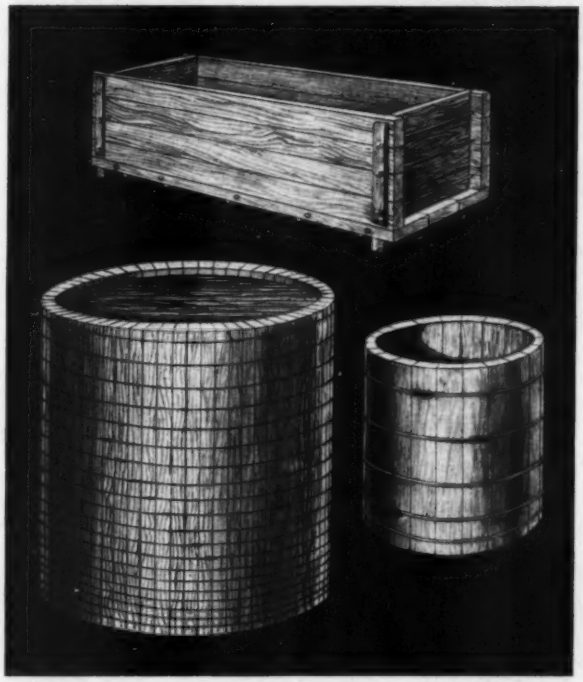

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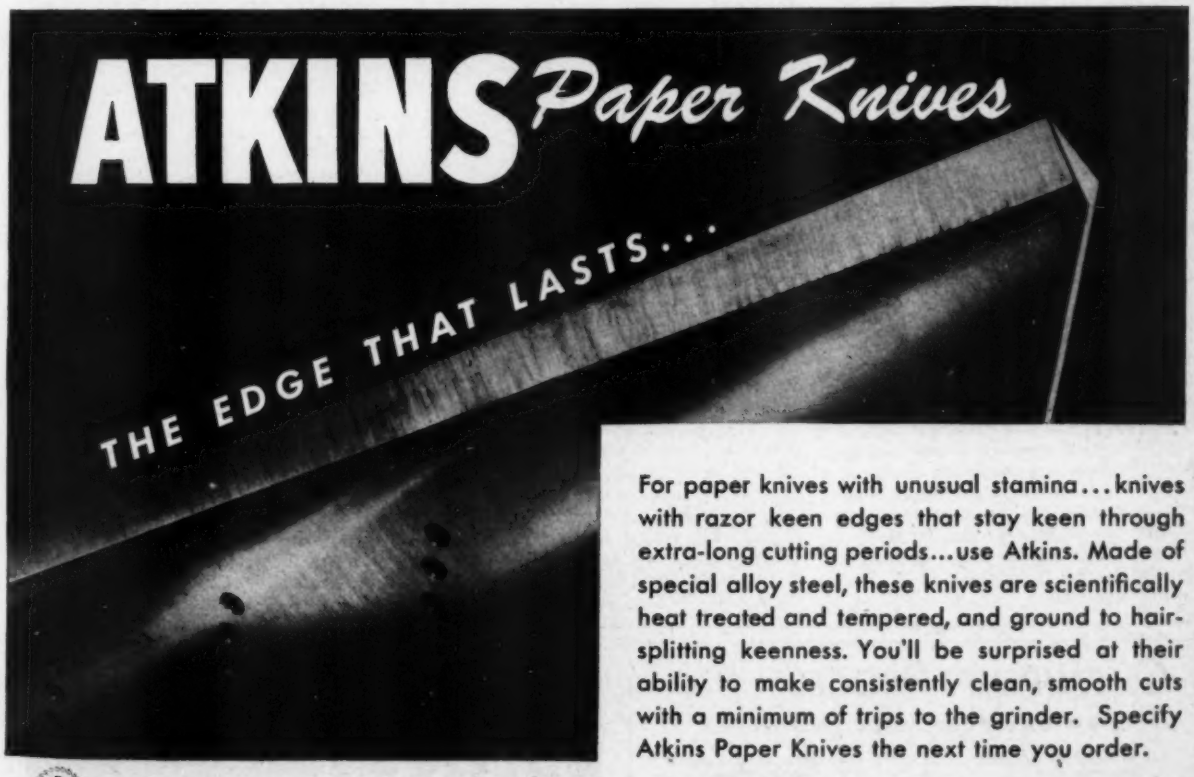

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tion has been calculated to be a little in excess of 23 million cords. The people of the United States consumed nearly three million tons of Canadian newsprint and exported a little over 300,000 tons of miscellaneous papers.

In the manufacture of the domestic production of 17.4 million tons of paper and board, the United States utilized a little more than 11 million tons of wood pulp, of which 10 million were produced domestically, 1.7 million were imported and 140,000 were exported.

The wood pulp, however, constituted only 57 per cent of the total fibrous material used in the production of paper and paperboard. In addition, the United States mills reused 6.8 millions tons of waste paper or 36 per cent of the total fibrous material consumption. Wood pulp probably made up at least 90 per cent of the reused waste material. Rags, straw, and miscellaneous fibers altogether made up only 7 per cent of the total fibrous materials used. To produce domestically the 10 million tons of pulp in 1945, the United States mills utilized nearly 17 million cords of pulpwood, of which 10 per cent was imported.

Stated another way, in 1945, the U. S. paper mills produced nearly 17½ million tons of paper and board from foreign and domestic sources but the people of the U. S. consumed 20 million tons. The U. S. pulp mills produced 10 million tons of pulp but the paper mills consumed nearly 11½ million tons. We cut from our timber lands a little over 15 million cords of wood but consumed in the form of wood, pulp, and paper approximately 23 million cords.

Before 1940 no one in the industry would have believed that it was possible to cut from our timber resources 15 million cords of wood annually; yet the record is there. Undoubtedly the drain on the timber resources has been great because that yearly record of 14-15 million cords was kept every year since 1941.

Some have questioned whether or not that level would have been maintained during peacetime development had not the industry invaded new markets as an incident to the war—markets in which the Armed Services were enough interested to aid substantially in bringing every pressure to bear on getting out more wood. It is true that high pressure propaganda techniques were employed during the war. By the aid of film and press, government approved use of prisoners of war, and by the mechanization of the woods operations which saved labor, pulpwood receipts were kept at a high level, much to the great surprise of almost everyone in the industry. But perhaps it was the mechanization of woods operation which was chiefly responsible.

With the absence of special government propaganda since V-J Day, despite the loss of the prisoners of war in the southern woods, and with the threat of a strike in the logging camps of the Pacific Northwest, pulpwood receipts for the first six months of 1946 were 7 per cent higher than for the similar period in 1945. Inventories increased 22 per cent over the similar 1945 period. Imports also increased. However, this may be a temporary state of affairs inasmuch as consumption of pulpwood is not quite holding its 1945 level while the mills are slowly building back their normal inventories. Pulpwood is available in quantities sufficient to meet present requirements, but what about future requirements?

Plans of management for mill expansion, when corrected for the factor of replacement and obsolescence, translate into concrete form the best thinking of the industry's leaders as to what future requirements are apt to be. This composite estimate is better than any single individual might make. A survey of these plans, converted into over-all capacity, has been made by one of the best economic analysts in the industry, Maurice Dobrow. The 1945 domestic paper and paperboard capacity of 19.4 million tons will be increased, he calculates, to 20 million tons by the end of 1946 *(Paper Trade Journal,* February 28, 1946).

Twenty million tons of paper and paperboard produced domestically by the United States mills, plus an estimated 3 and ½ million tons of imported newsprint, would mean a consumption level of 23 and ½ million tons. This consumption level would, in turn, require approximately 26 million cords of foreign and domestic pulpwood over and above the amount in the paper reused as waste, a factor which undoubtedly will continue to be important.

Let us assume that our pulp imports from Canada will stay high and will increase at least to the extent that the pulpwood imports decline, because several U. S. mills are building pulp mills in Canada and will ship pulp into this country instead of pulpwood. The increase will be offset somewhat by a decline in European imports. Therefore, although there will be an actual increase in total pulp imports, it is not likely that the rate will increase. We can probably expect 2 million tons of imported pulp annually from Europe and Canada. If we can assume the correctness of the over-all ratio of 1.66 cords of wood per ton of pulp, that pulp would require for its production 3.3 million cords of pulpwood, or roughly 3½ million cords. Estimated imports of newsprint and wood pulp combined would require approximately 7 and ½ million cords of pulpwood. This, subtracted from our total requirements level of 26 million cords, leaves 18 and ½ million cords to be cut either in this country or imported as pulpwood.

If Canada would provide 10 per cent of the pulpwood required by our pulp mills, as she did in 1945, we would need to cut domestically only 16,650,000 cords, or 1,650,000 cords above the amount cut in 1945. However, in this respect we cannot assume that present levels will be projected into the future. The long-time trend has been to reduce the amount of pulpwood exported from Canada and this trend has not been reversed nor is there any sign at the present time that it will be. It is only being realistic, therefore, to assume that the percentage will drop below 10, probably 8, and maybe lower.

Let us use 8 per cent for the sake of being specific and assume that Canada, in this hypothetical year when paper and paperboard consumption will require 26 million cords of pulpwood, will provide us with 1.5 million cords of pulpwood. If that estimate is approximately correct, then we would have to cut domestically 17,250,000 cords annually in our own country, or 2,250,000 cords above the peak 1945 level. Can we do it?

Two alternatives are open. First, that we do not try to do it but that we make every effort to increase our imports to make up the difference. Second, that we, as an industry, determine we will make up that difference in this country. Both choices carry with them many economic implications.

We have never been completely self sufficient in the past. Do we want to become more dependent than we have on foreign sources? Perhaps the economic desirability for being self sufficient is in itself debatable. It can be argued on the one hand that to the extent that we can meet our pulpwood requirements in the form of paper, pulp or wood, in foreign countries, even in the Soviet Union, to that same extent we can save our own limited resources. On the other hand, it could be argued that our industry would be better off if we did not become embroiled in the price wars which countries with monopolistic conditions could impose on our competitive economy. As cellulose grows in importance in the nation's economy, our dependency on European sources carries with it the probability of our being adversely affected by any crisis which might arise. In general, in such arguments in the past, imports from Canada have been considered in a separate category from those of European countries. Our neighborliness with Canada, our proximity to her forests, the seeming impossibility of ever going to war with her, have all placed our Canadian imports in

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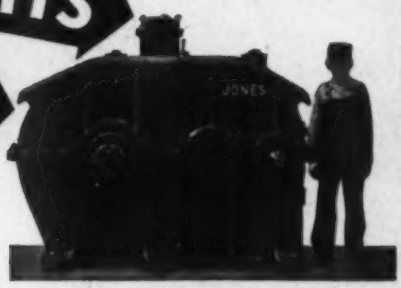

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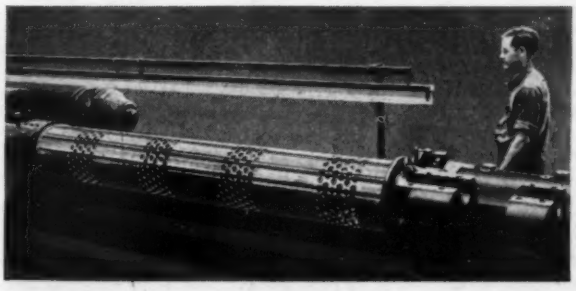

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the light of borrowing from within the family and have caused her to be excluded in many arguments used against our dependency upon foreign countries.

Actually, in the future, as in the past, the desirability of importing any amount of our pulpwood requirements will depend not on the wisdom of the argument but on the simple economic principle of whichever is cheaper in relation to quality offered in the open market. So long as imports from Canada and Europe, and the Soviet Union, provide us with the means of meeting our requirements more cheaply than we could do it by utilizing our own resources, we will continue to be dependent upon foreign sources. If any foreign country can ship us wood, pulp, or paper cheaper than we can utilize available resources at our disposal, there is nothing in our present economy which would stop us from importing, unless we decide nationally to erect tariff barriers. It is well for us to keep this in mind, because it places the added burden of statesmanship on our industry's leaders either to conform with or take part in formulating the nation's foreign policies.

Economically, the supply aspect is one of special species, geographical locations and is determined by the level of prices at which supply and demand are balanced. Second growth pulpwood may be more expensive than that of virgin forest, depending largely upon the distance the virgin wood has to be hauled. With our pulpwood supplies getting more and more inaccessible, transportation costs are bound to increase. It is true that improvements in the techniques of transportation have to some extent offset the increased cost of longer and longer hauls to obtain virgin timber. But real transportation costs, that is, real in the sense of relationship to total costs irrespective of the fluctuations of the dollar, have increased for most of the pulp mills.

If our pulpwood requirements can be met by highly cultivated forests, as many foresters believe and as some mills are doing, the capital investments in the privately run pulp and paper industry, already out of all proportion to the value of our products, will have to be increased. This too, will increase real costs. The pulp mills are accustomed to handling large investments. Unlike the other wood-using industries, these investments in permanent machinery have caused the pulp industry to stay rooted in one place irrespective of a receding raw material supply. For that reason, an added investment in forest cultivation would only enhance the capital already invested in nonmovable forms.

Until the new investment in forestry nets a return in the form of adequate supply of pulpwood within easy reach, many of the pulp companies will be forced to buy out or build mills in regions where timber stands are more accessible. Many of the Northeastern companies have done just this. There are outstanding examples of mills which have actually lowered production costs through reforestation but those are mills whose transportation costs in getting virgin timber became exorbitant.

Theoretically, it is conceivable that reforestation, which has become more and more acceptable in the pulp and paper industry, could suffer a set back if air freight transportation could be developed and applied, let us suppose for argument's sake, to the virgin Alaskan forests. Pulpwood then would be supplied to the Northeastern and Lake State mills more cheaply than could be obtained by growing it on timberlands owned by the mills. It is this factor which has caused many interested in the timber resources of the country to state that private enterprise cannot be counted on to carry forward a national plan of reforestation that is in the interests of the public as a whole.

When private individuals owned timberland, usually it was not to their personal advantage to cultivate forests as they could not expect a return on the capital and labor expanded during their lifetime. But, with the development of the corporation, the element of longevity was inserted in the concept of future valuation. Corporations could afford to wait 50 years for a net return on particular trees. Economically, the time involved in growing trees from seeds is not as important as the rate of current growth of the trees just ready for cutting.

Despite the stated intent of the 1927 Forest Crop Law in Wisconsin, to use it as an illustration, it has been to the advantage of only a very small number of the larger pulp companies to enter their lands under the Law. Tax exemption for the county forests has placed the competitive bidding for wood on a basis that makes it uneconomical for many of the pulp companies to grow their own pulpwood. It would seem that the tax laws still act as a discouraging factor in their forestry practices for any private companies.

The role of the state has not always been well analyzed in many discussions on whether or not private capital can and will invest in growing forests to the extent that is desirable to assure sufficient growth to meet the increasing demand for the forest products. Private companies must act economically in order to exist. To the extent that forestry is not economical, the mills cannot engage in it. Wood may be cut by the pulp mills before it has reached its optimum growth for proper utilization, because the cost of holding it may not be offset by the increased value of the wood when removed. The reason for cutting it may be partially the fault of the state through taxation laws which conflict with government-sponsored principles of good forestry.

In the past, when pulpwood was plentiful and cheap in this country, other costs were relatively high. As the preferred species of pulpwood became harder to obtain and, therefore, more costly, the industry found ways and means of increasing the general productivity by lowering other costs. Labor-saving equipment has constantly been one of the biggest factors in reducing other costs. Now it remains to be seen whether or not the industry can continue its juggling act.

Some mills have found that they can juggle costs between those items which are highly profitable and those which are marginal. The former helps pay for the latter. We have been unsurpassed in our development of all manner of specialty paper items which have become a part of our standard of living. Innumerable items will come to mind instantly. A similar solution to the problem of rising costs is also seen in the commercialization of the by-products from the pulping operations. Usually, in the case of paper specialties, there is no world competition to meet. Prices, therefore, can be held above the cost of production. As prices rise, however, demand is reduced. At various times the commercial feasibility of new processes has altered drastically our conception of pulpwood resources and our efficiency

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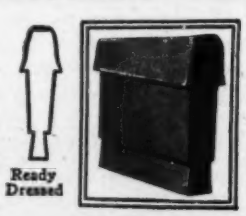

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in utilizing them. The gates are wide open for any new development which will lower costs by making commercially advantageous a process, method, or new raw material which was formerly not feasible.

The dynamics of the economy of our industry is a study worthy of the best minds in the industry. Price relationships, as they affect the industry as a whole and each segment and mill in it, show the changes as freight rates rise or fall, as interest rates are lowered or raised, and as labor costs change. What may be the case today may not be tomorrow.

To the extent that the ingenious leadership of management coupled with that of scientists, technicians and practical operators, all working co-operatively to make more efficient the methods of production by any means they can discover, to that same extent will the industry be able to meet adequately the potential pulpwood requirements in profitable operations without becoming alarmingly dependent upon any foreign country. The methods used among others may include: better forest cost accounting which will undoubtedly help point up the unproductive and inefficient activities there; better means of transporting wood and of reducing the cost of handling wood; better methods of financing the cultivation of forests on an intensive enough scale to meet the needs of existing mills; making available wood of any kind even though the use of the particular species will require considerable and perhaps expensve research and development; further exploitation of ideas for new items which will meet a consumer need and which will not compete on the world market but will help defray rising costs; and many other ways which will be the result of more intensive research and study.

Many of the technicians are getting more interested in the economics of the industry because they realize that it is toward the solution of the industry's economic problems that their scientific, technical, and creative abilities must be directed.

Wood Handling and Processing Equipment*

J. A. FRITZ
Allis-Chalmers Mfg. Company

A number of years ago, the Allis-Chalmers Manufacturing Company embarked on a program of research on hydraulic log barking, which has resulted in some startling changes in the accepted methods of barking pulp and saw logs.

Hydraulic barking has made the use of hardwoods possible which heretofore were limited in their use as pulpwood because of the extreme difficulty in removing the bark.

There are approximately 24 Streambarkers in operation in the United States and Canada, more than 30 per cent of them successfully barking hardwoods such as maple, birch, beech and other species.

Plants which have the Streambarkers report dirt counts dropping from 5 to 15 per cent. The necessity of having clean groundwood pulp is well known. It is a matter of record that Streambarker operation on poplar have resulted in the savings of from 8 to 13 men in a 16 hour operation on the cleanup end.

For years the industry has talked about utilizing waste materials. Allis-Chalmers has finally done something to utilize these waste woods and also waste bark. Recently two machines have been developed for the utilization of waste wood and bark—the Interplane Grinder and Defiberizer. The Interplane Grinder has been designed for reduction of wood and bark fibers. The degree of fineness can be easily controlled

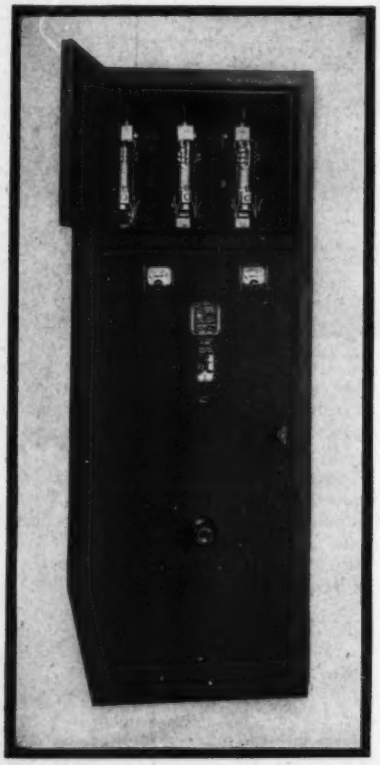
The Defiberizer has been designed to reduce wood waste for various purposes such as building papers and chip board. This machine consists of a two-pocket hopper in which 30 inch logs are fed, located above two steel brush heads with flat needled type cutters mounted on arbors with anti-friction bearings in oil-tight adjustable housings. The machine is driven by two 40-hp. motors for brush heads and one 10-hp. motor for the hopper drive, and weighs approximately 22,000 pounds. It is built sturdily and will give many years of service. A number of these machines are in daily use and have given excellent results.

(*) Abridgment of paper presented at the annual meeting of The American Pulp and Paper Mill Superintendents Association, held in Poland Spring, Maine, June 17-20, 1946.

NEW EQUIPMENT AND SUPPLIES

High Voltage Combination Starters for Electric Motors

Electric Machinery Mfg. Co., Minneapolis, Minn., has announced a new line of *Hi-Fuse* Polarized Field Frequency Synchronous Motor Controls with current-limiting fuses. Furnished in voltage ratings up to 5,000 volts, with a current interrupting capacity of 60,000 amperes asymmetrical, these controls feature: complete protection of motor and starter, through co-ordination of functions of fuses and oil switch; protection of personnel through segregated and interlocked high and low voltage compartments; positive circuit interruption on fault of high and low magnitude; limiting of short circuit

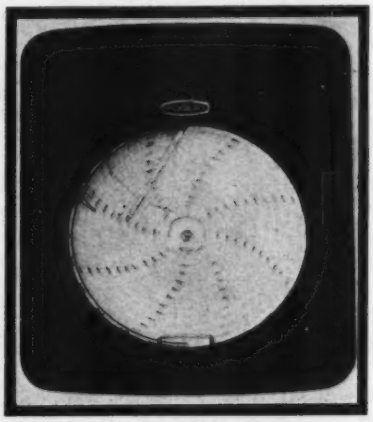


currents and surge voltages; easily replaceable fuses; and the polarized field frequency relay system of control, as indicated by the name designation of the line.

Enclosures for the starters are available in N E M A Types 1, 1-A, and 5.

New Design of Controller

The Foxboro Company, Foxboro, Mass., has announced Model 40 Controller as a development to replace the Model 30 for control of temperature, pressure, flow and other variables in continuous processes, or others in which control requirements are exacting. An outstanding characteristic of the instrument is its adaptability in changing from one type of control to another. Elimination of the re-set and derivative functions is extremely simple, when desired. An improved adjusting device permits zeroing the pen without realigning the control points and a transfer switch enables the operator to



change from manual to automatic control, or vice versa, easily and rapidly and with no valve motion.

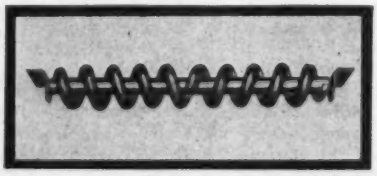
The mounting of the transfer switch and reducing valve on a manual control panel permits the removal of the entire instrument from its location, leaving behind this sub-panel, with the process still under pneumatic control by manual operation.

The die-cast aluminum case, similar to that of Model 30, fits the same opening in an instrument panel. All connections are in the bottom of the case.

The instrument is made as an indicator as well as a single-pen and multi-pen recorder, and is available for on-off control action, proportional, proportional and reset (Stabilog), proportional with derivative, and proportional and reset with derivative (Hyper-Reset).

Spiral Return Idler for Belt Conveyor

Chain Belt Company, 1600 W. Bruce St., Milwaukee 4, Wis., has announced a rubber covered spiral return idler for belt conveyors. The spiral part of the idler, composed of right and left hand sections, is of flat-bar steel in the form of a helix. This part is welded to a bearing tube.

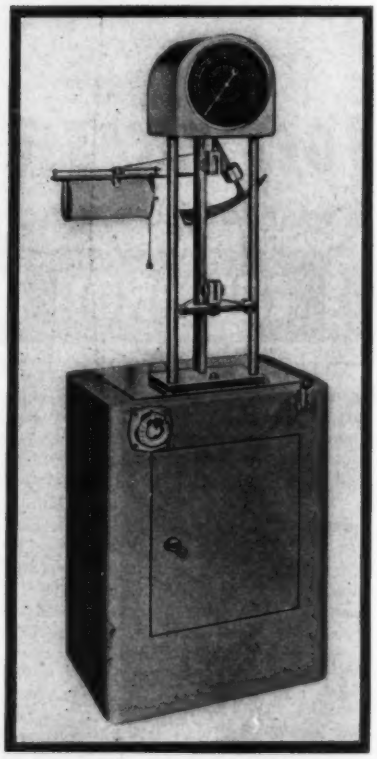


The rubber used as the spiral covering snaps over the bar and is securely clamped at each end. Each end of the roll is equipped for high pressure grease lubrication, and is regularly furnished with hydraulic type fitting.

Among the claims made for the idler are: greatly retards ice forming on roll in freezing weather; and minimizes "build-up" on roll when handling sticky materials. It also is claimed that the rubber to rubber contact between idler and conveyor belt keeps abrasive and corrosive action of materials being handled to a minimum.

Combined Tensile and Bursting Tester

W. C. Dillon & Company, Inc., 5410 West Harrison St., Chicago 44, Ill., has announced a testing device, the Dillon Low-Range Tester, which has been designed primarily for determining the tensile strength of materials within the range



of zero to 100 lb. but which also can be used for making bursting strength determinations. In the latter case, special fixtures are available for attachment to the tester.

The dial of the test incorporates four separate capacities: namely, 0-10 lb. in 1 oz. dial divisions, 0-25 lb. in 2 oz.; 0-50 lb. in 4 oz.; and 0-100 lb. in 8 oz. Each of these four capacities is available instantly.

The lower grip travel is continuously variable, or stepless, from zero to 19 in. per minute. Other features include pendulum action, maximum load reading, featherweight and swivelled upper grip, stroke limiting switches, forward-reverse switch, elongation gauge, and a stress-strain recorder. Accuracy of the tester is given by the manufacturer as ½ of 1 per cent.

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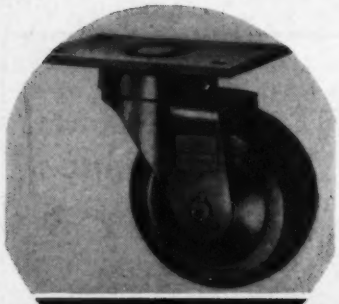

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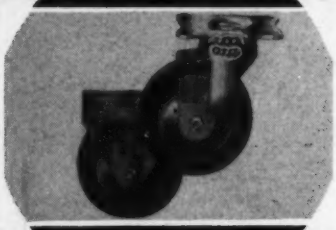

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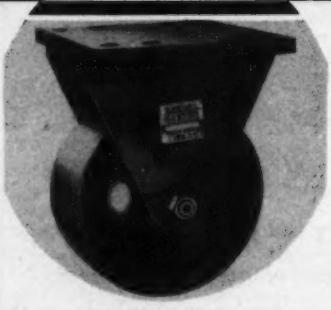
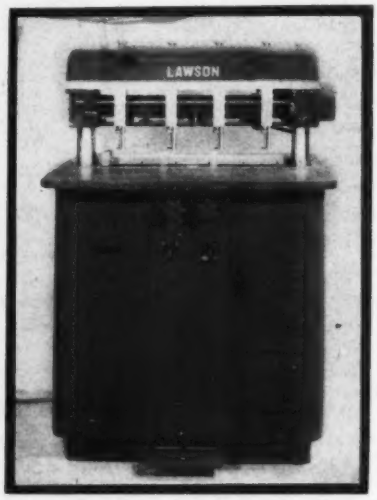


Drill Slotter

E. P. Lawson Company, 426 W. 33rd St., New York, N. Y., has announced a multiple head drill slotter that drills and slots in one operation. Its table is in a fixed position. Its toe-tip tread control brings the drills down to the work. Heads are quickly adjustable from front of machine. Spindles may be adjusted vertically while heads are in operation.

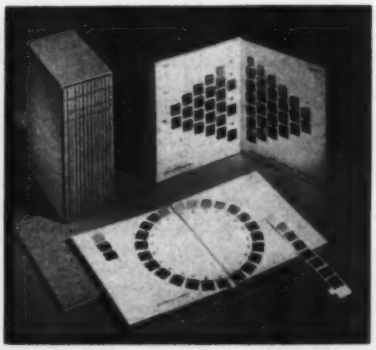


Other features include: fluorescent floodlight across front of machine; working parts equipped with roller, ball or needle bearings; and screw-operated back gauge (it rides in a V-slot and is adjustable from front of machine).

In operating this machine, the chips are carried automatically to a removable refuse box.

Color Harmony Manual

Color Laboratories Division, Container Corporation of America, 111 West Washington St., Chicago, Ill., has announced the publication of a large Chip Edition of the Color Harmony Manual. This edition consists of 12 handbooks containing 680 movable color chips, a work chart, a removable gray scale holder, a twenty-four page illustrated text, and a buckram covered box.

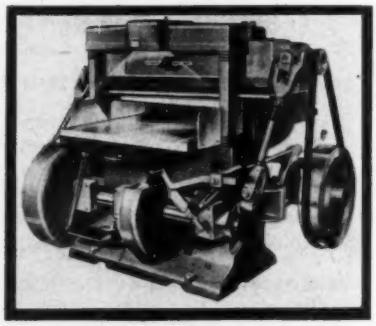


The individual color chip is one inch square plus a tab (two and one-half times more working area than an individual chip of the first edition which was brought out in 1942). On each tab is printed the complete Ostwald notation for that color. All chips are removable from their positions which are marked accordingly for easy return.

The work chart allows the arrangement of circular or linear series of chips. The gray scale chip holder may be fastened in any handbook.

Paper Cutter

Harris-Seybold Company, Cleveland 5, Ohio, has announced the new *Seybold Heavy Duty 40" Cutter*. Among the features of this cutter are: continuous shear with double end pull operation; clamp pressure with all metal friction unit; heavy duty multiple disc clutch; and quick acting knife adjustments.

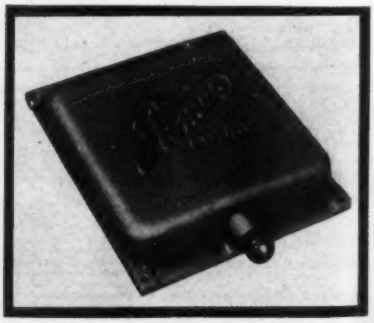


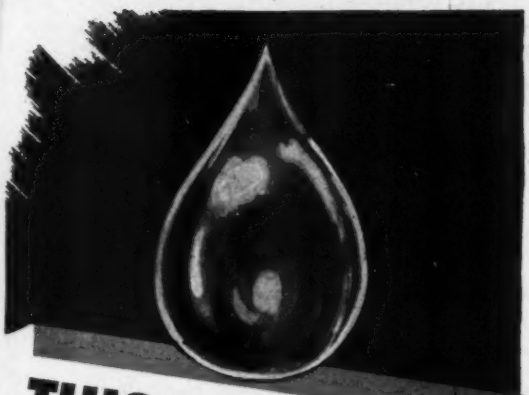
Repositioned lubrication points and the installation of a Zerk system make for more efficient servicing and decreased maintenance.

Major safety features include a mechanical two-hand starting device, non-repeat mechanism, safety guards, and safety washers. The cutter also has complete illumination.

Tramp Metal Extractor

The Homer Manufacturing Co., Inc., Lima, Ohio, has announced a tramp metal extractor which has been designed for use with all types of free flowing solid or fluid materials from which tramp iron or steel must be extracted. Designated as the *Homer-Triple-Air-Gap Permanent Magnet*, the device, equipped with a cast aluminum frame, is built in six standard sizes. A new magnet, according to the announcement, exerts a 12-lb. pull on a one-inch annealed steel ball at an angle of 45 deg.





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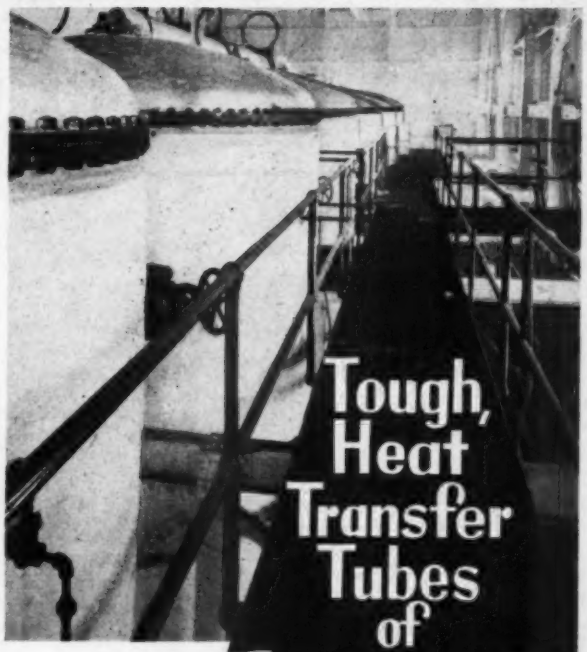

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Analysis of Tall Oil

Inasmuch as the complete analysis of tall oil requires much experience and is very time-consuming, rapid methods were developed for its routine analysis. The present article gives (I) rapid procedures for crude tall oil, (II) rapid methods for distilled tall oil, and (III) the more complete analysis of the oil. These methods were accepted in Sweden in 1945.

(I) Includes water content, ash, water-soluble acids, acid number, saponification number, resin acids (including other difficult esterifiable acids) and fatty acids (including other easily esterifiable acids) and unsaponifiables. (II) Includes the following: acid and saponification numbers, unsaponifiable matter, and resin acids. The fatty acids are determined by difference. Furthermore, under (II) the refractive index, specific gravity and the viscosity are also determined. In the case of (III) the following determinations are made: water content, saponification and acid numbers, unsaponifiable matter, acids insoluble in petroleum ether, resin acids and fatty acids.

Besides these determinations, a method is given for the analysis of unsaponifiables by means of ether, and a Finnish method for determining acids insoluable in petroleum ether directly on the original tall oil sample. A rapid method for resin acids determination (given by Hastings and Pollak) is also included. Central Lab. of Cellulose Chemistry. Analysis Committee. Svensk Papperstidn. 49, No. 5, 97-105; No. 7, 147 (1946). Original in Swedish, with English summary. Through Bull. Inst. Paper Chem. 16, 541-2 (1946).

Carbon Papers

Rule-of-thumb procedure has been supplemented by a more scientific approach to the manufacture of carbon papers. In carbon paper inks the three main ingredients are oils, waxes and coloring matter. Oils are selected for their non-drying properties, and their function is to produce softness and compactness of the ink, thus controlling the amount of ink that is deposited on the copy. The wax is apparently the complement of the oil. Its main purpose is to keep the ink sufficiently dry and hard at room temperature. The vegetable waxes, candelilla, carnauba, and ouricury are used largely (although nearly any type of wax could be utilized). The wax acts as a vehicle for the coloring matter, and prevents the ink from sinking completely into the paper. All types of colors are used in carbon paper. They include carbon black, lake colors, toners and dyestuffs. The color is the prime ingredient. The paper used is also important. Its basis weight ranges from 16 lb. down to 4 lb. It has the thickness of cigarette paper, and must be completely free from pinholes. Actual coating of the carbon paper is a continuous process. The paper, usually in the form of 200 lb. rolls, is fed into the coating machine through tension bars to remove wrinkles and puckers, and then passes over the inking roll which carries the melted paste ink supplied by a heated fountain. Excess ink is scraped off by means of a small diameter rod over which the paper is drawn. The coated sheet then passes over a water-cooled cylinder. A modern machine can produce 12 to 14 miles of carbon paper *per diem*. Recent developments include the use of the same paper for reproducing 20-25 copies, better hectograph carbons, and the treatment of the back of carbon sheets to prevent curl. Alan B. Olsen. Chemical industries 59, No. 1, 70-1 (1946).

Wall Paper Built on Thermoplastics

Varlon is a plastic impregnated paper which forms a new wall covering. The cloth or paper used for backing is only for the convenience of hanging. This backing may be rendered resistant to mildew, vermin or mold. However, if a special bonding solution (which is resistant to these factors) is used, insect- and mold-proofing becomes unnecessary, inasmuch as during the application, the adhesive enters the paper and thus renders it resistant to attack. Decorative effects can be obtained which simulate wood-block printing. Many advantages are claimed for this new development. Stains may be washed from the wall paper without leaving marks. The covering may be washed with soap and water, even with hard rubbing.

On the other hand care must be exercised in the use of turpentine, and if disinfectants are used they should be rinsed from the wall-paper surface as soon as possible. Furthermore it is inadvisable to use carbon tetrachloride, gasoline, or abrasives. The paper withstands high and low temperatures as well as sudden temperature changes. It is not readily combustible. It stands high humidity, direct exposure to steam as well as salt water. This covering is recommended not only for homes but for institutions and various transport media Anon. Modern Plastics 23, No. 8, 140-1 (1946), through the Bull. Inst. Paper Chem. 16, 517-8 (1946).

Effect of Steaming on Hard and Softwoods

"When wood is steamed prior to defibration, chemical and physical changes occur that bring about marked losses in weight. The author terms this percentage loss as the "degree of steaming." In general the hardwoods (deciduous trees) were much more affected than were the conifers, when steam at four atmospheres contacted the wood for a period of 18 hours.

The losses for different Russian pulpwoods were as follows: Pine, 11.8%; spruce, 11.9%; fir, 12.0%; basswood, 19.0%; aspen, 19.5%; birch, 24.4%. The degree of steaming is greatly influenced by the initial moisture content of the wood. The most satisfactory results in steaming spruce were obtained when the wood contained about 30% water (approximately at the fiber saturation point). When streamed, the volume of the green wood decreases, whereas that of dried wood increases. B. S. Darovskii, Bumazhnaya Prom. (U.S.S.R. Paper Industry) 20, No. ½, 26-34 (1945); through C. A. 40, 3599 (1946).

Sizing Paper and Economizing On Rosin and Alum

Several different kinds of paper size are discussed. From the standpoint of the author, the most desirable sizes were Bewoid and rosin-paraffin size. Both may be prepared easily, and both have the great advantage of reducing the amounts of rosin and papermakers alum consumed. Ferric sulphate can be used successfully in replacing aluminum sulphate. The author suggests that to produce sizes of uniform quality their production is best carried out at special, centralized plants, such plants supplying various sizes for the different types of paper. E. V. Lipshitz. Bumazhnaya Prom. (U. S. S. R. Paper Industry) 20, No. ½, 56-63 (1945); through C. A. 40, 3602 (1946).

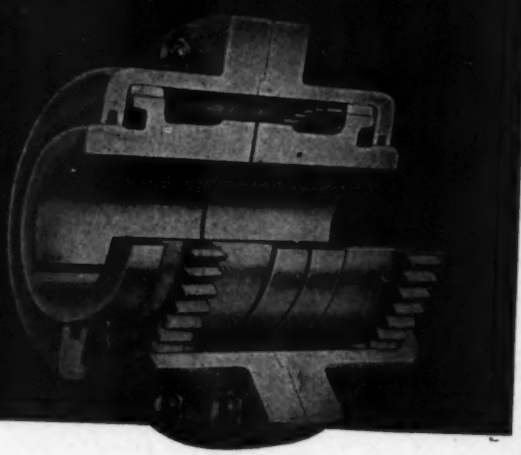
Waste Wood Utilization

The author refers to the possibility of chemical processing of wastes of the woodworking industries, through simple methods requiring modest equipment and investment. Such wastes may run from 5 to 50 tons at each plant per day as compared with at least 200 tons of hardwood consumed by a pulp mill during the same time period. The emphasis should be on high yield pulps still retaining lignin. Sodium sulphite is strongly suggested as the most suitable basic cooking material in the development of semi-chemical or high-yield pulping methods. Harold R. Murdock. Ind. Eng. Chem. 38, 81-2 (1946).

Fodder Yeasts From Wood Sugar Stillage

Sugar wastes were exposed to the action of the following yeasts: *Torula*, *Mycotorula*, and *Hansenula*. All three yeasts act well on still waste liquor from the hydrolyzates of Douglas fir, and their action is very similar. There seems to be very little difference in their rate of growth, their ability to utilize the sugar, the yield of the yeast, or the nutritive value of the products. On drying, the yeasts form a fodder that is an excellent source of protein and vitamin B. The yields of dry yeast ranged from 53-63% based on the weight of sugar consumed. Twenty references are given. E. F. Kurth and V. H. Cheldelin. Ind. Eng. Chem. 38, No. 6, 617-9 (1946).

POOLE



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PAPERMAKING PATENTS

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Photographic Paper

Patent No. 2,394,289. Fred W. Boughton, Rochester, N. Y., assignor to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey. Application September 12, 1944, Serial No. 553,794. 7 Claims. (Cl. 95—8).

1. Paper having a sizing including ¼-5% (based on the bone dry weight of the pulp) of a melamine resin and the aluminum salt of a monobasic acid, the paper being substantially free of polyvalent inorganic acid ions, and a photographic silver halide emulsion coating applied on said sized paper, said sizing imparting high wet strength and resistance to blistering and frilling to the paper and being chemically inactive to deteriorate the light-sensitive chemicals of said coating.

Evening Roll for Flow Boxes

Patent No. 2,390,977. Herman J. Williams, Charleston, S. C., assignor to West Virginia Pulp and Paper Company, New York, N. Y., a corporation of Delaware. Application April 16, 1941, Serial No. 388,737. 1 Claim. (Cl. 92—44).

In a Fourdrinier machine having a flow box, a slice therein defining an opening for the outflow of stock from said box and regulating the flow thereof upon the Fourdrinier wire disposed beneath the box, and a stock flow evening roll disposed rearward of said slice and toward the bottom of said box beneath the normal liquid level therein, the improvement which comprises in combination a perforated flow evening roll longer than the width of said box, such roll having the perforations thereof disposed substantially uniformly over a length of the roll opposite said opening and at least equal to the length of said opening, each end of said roll terminating in a bearing portion of restricted diameter, bearing proper for said bearing portions, each of said bearings proper comprising a housing enclosing an end of the roll but without affording a bearing surface therefor, and means for preventing accumulation of fiber within said housings including means for supplying liquid thereto at a pressure slightly greater than the hydrostatic pressure within said box.

Mechanism for Creping Paper

Patent No. 2,393,672. Frederick P. Wood, Adrian, Mich., assignor to Simplex Paper Corporation, Adrian, Mich., a corporation of Michigan. Application June 26, 1944. Serial No. 542,224. 6 Claims. (Cl. 154—30).

1. In a machine for creping paper, the combination of a backing element adapted to support a traveling paper web, a plurality of flexible creper bars provided on their inner faces with spaced teeth adapted to be brought into contiguous compressive relation to the backing element to engage the paper surface while supported thereon, carrier elements for the ends of the creper bars, means for advancing the carrier elements in unison with the advance of the paper web, and means for varying the flexure of the creper bars concurrently with their advance to reduce the spread of the teeth while the creper bars are in compressive relation to the backing element.

Riffler for Cellulose Stock

Patent No. 2,394,378. William E. Henry, Hopewell, Va., assignor to Hercules Powder Company, Wilmington, Del., a corporation of Delaware. Application August 7, 1943. Serial No. 497,789. 4 Claims. (Cl. 92—28).

1. A riffler for use in treating a stock of cellulose materials having in combination a sluice trough and a plurality of riffle units disposed therein; the sluice trough having water impervious sides and bottom members; and each of the riffle units comprising a substantially plane foraminous screen member provided with a multiplicity of perforations in spaced relationship to the bottom of said trough; a plurality of supporting and spacing members securely affixed to the bottom of the foraminous member transversely of the trough adapted to maintain said spaced relationship and provide stilling areas between said supporting members; at least one overflow member of substantial height disposed above said foraminous member; and means for integrally removing said unit from its functioning position to a second position whereby cleaning of the sluice trough is facilitated.

Suction Roll Helper Drive

Patent No. 2,392,150. Lloyd Hornbostel and Edward D. Beachler, Beloit, Wis., assignors to Beloit Iron Works, Beloit, Wis., a corporation of Wisconsin. Application May 20, 1942, Serial No. 443,680. 10 Claims. (Cl. 92—44).

1. In a Fourdrinier type paper making machine including a looped forming wire, a main couch roll within the loop of said wire, a primary suction couch roll within the loop of said wire for acting on stock deposited on the wire in advance of the main couch roll, means for driving said main couch roll to drive the wire, a helper drive between said means and said primary suction couch roll, and pressure responsive control means controlled by the degree of vacuum in the primary suction couch roll for automatically varying the driving effect of said helper drive so as to correlate the amount of drive on said primary suction couch roll with the traction between said primary suction couch roll and the wire.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC. REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of The Paper Industry and Paper World, published monthly at Chicago, Illinois, for October 1, 1946.

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared A. Scott Dowd, who, having been duly sworn according to law, deposes and says that he is the business manager of THE PAPER INDUSTRY AND PAPER WORLD and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit.:

1. That the names and addresses of the publisher, editors, and business managers, are: Publisher, Fritz Publications, Inc., 59 East Van Buren Street, Chicago, Ill.; Editor, Besse Merrithew, 59 East Van Buren Street, Chicago, Ill.; Editorial Director, Harry E. Weston, 59 East Van Buren Street, Chicago, Ill.; Business Manager, A. Scott Dowd, 59 East Van Buren Street, Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual members must be given.) Fritz Publications, Inc., 59 East Van Buren Street, Chicago, Ill.; Mrs. Annie C. L. Fritz, 6801 South Crandon Avenue, Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

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5. That the average number of copies of each issue of this publication sold or distributed, through the mail or otherwise, to paid subscribers during the twelve months preceding the date shown above is

(This information is required from daily publications only.)

A. SCOTT DOWD
(Signature of business manager.)

Sworn to and subscribed before me this 25th day of September, 1946.

[SEAL] THOMAS H. STEVENS, Notary Public

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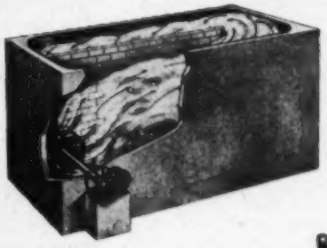

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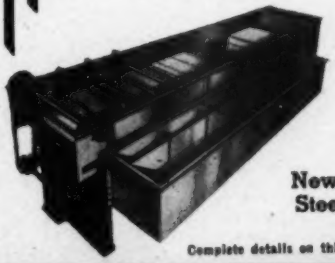

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American Society of Lubrication Engineers, 135 LaSalle St., Chicago, Ill.—A reprint of a speech by A. J. Jennings, The Farval Corp., Cleveland, Ohio, delivered at the first Spring meeting of the American Society of Lubrication Engineers held at Chicago, April 5 to 6, has been issued by the society. The paper traces the history of centralized lubrication and describes some of the devices employed by various industries. Description of the economy and application of centralized lubrication are given regarding presses and forging machines, machine tools, rubber mills, and rolling mills.

Binks Mfg. Co., 31[illegible]-40 Carroll Ave., Chicago, Ill.—Stationary diesel engine efficiency and operating cost are discussed in a booklet released by this company. Pictures, diagrams, and blueprints are provided which will help in solving problems encountered in diesel engine cooling. The bulletin is identified as No. 351 and shows how water jacket scale, overheating, costly breakdowns, and insurance rates can be substantially reduced or entirely eliminated.

Chicago Metal Hose Corp., Maywood, Ill.—Ready for distribution the new compensator bulletin presents specifications and data for the installations of C.M.H. Compensators. In addition to the complete explanation of compensators and the uses made of them in industry, diagrams of typical applications are given, together with information on working pressures, corrosion, expansion, temperature, deflection, movement, and other conditions of interest to users of piping.

Clark Tructractor, Division of Clark Equipment Co., Battle Creek, Mich.—An illustrated sixteen-page booklet recently published describing the new Clark trucloader and truck loading equipment is available. Fundamental facts for the industries which handle large materials shipments, a fan folder diagram outlines five problems which can be solved by the Clark Trucloader.

Du Pont de Nemours, E. I., and Co., Finishes Div., Wilmington 98, Del.—"Du Pont Color Conditioning for Industry,"" is the title of a thirty-two page, illustrated, full color booklet which relates the research and practical experience with color in industry. As a means of increasing production, of improving seeing conditions, and of creating better working environment, the fundamental principles of color conditioning in industry are outlined. Photographs of actual installations are presented in three dimensional treatment and the safety color code for industry is presented as well as a co-ordinated functional color program for the entire plant.

Kropp Forge Co., 5301 W. Roosevelt Rd., Chicago 50, Ill.—List No. 225 which catalogue this company's steel flanges for boiler, marine, welding, high hub, double hub, tank, spud, offset, and horseshoe type installations has been released. The sixteen-page bulletin contains sectional drawings, complete specifications (as well as American standards for threads and dimensions) for wrought iron steel pipe. Also data are given for working and bursting pressures which limit the operation of the flanges.

Murray Mfg. Co., D. J., Wausau, Wis. Details and capacity tables covering the various models of Grid Unit Heaters are given in a twelve-page, illustrated pamphlet released by this company. Features of construction and design are described, and an explanation given of one-piece cast heating sections capable of withstanding pressures up to 250 lbs. and of a corrosion resistant character.

Norton Co., Worcester, Mass.—A new type of aluminum oxide abrasive known as "32 Alundum Abrasive" is discussed in detail in a colorful folder released by this company. For use in tool grinding, surface grinding, and internal grinding, what the new abrasive is, does and how it is made is outlined.

Roots - Connersville Blower Corp., Connersville, Ind.—Just issued, Bulletin 120-B-13 covers centrifugal blowers and exhausters showing the wide variety of application R-C products have found in industry. Offered in both single and multistaged types, with capacities up to 100,000 cfm each unit is tailored for the job. Testing is carried on to determine the safety and durability of the units. These processes are part of the description of the blowers and exhausters made in the booklet.

Solvay Sales Corp., 40 Rector St., New York 6, N. Y.—A new edition of the Solvay Technical & Engineering Service Bulletin No. 5, entitled "Soda Ash" has been issued by the company. The work is sixty-four pages in length and is of interest to operators and technical men in industries using soda ash since the properties of soda ash, bulk shipments, storage, conveying, elevating, unloading, weighing, proportioning, and sampling and analysis are discussed.

Books

Barrell's Paper Annual (Fifth Edition)—This volume, published by William L. Barrell Company, Lawrence, Mass., features three articles: namely, The Dard Hunter Paper Museum, by William Bond Wheelwright; Change, The Only Constant in Paper Technology, by R. G. Macdonald, secretary-treasurer, Technical Association of the Pulp and Paper Industry; and The Paper Industry in Transmission from War to Peace, by E. W. Tinker, executive secretary, American Paper and Pulp Association.

In addition, the Annual carries a Directory of Officials of Paper Industry Associations (1946-1947), and concludes with a quinquennial index of the five volumes of the publication to date.

Organic Chemistry (Second English Edition — Revised and Enlarged) — Authored by Paul Karrer, professor at the University of Zurich, this edition is based on the eighth German edition of the work. The first English edition, based on the sixth German edition, was translated from the German by M. J. Mee, head of the Science Department, Glasgow Academy. The translation of the additions and revisions incorporated in the present edition was made by M. F. Darken.

Totaling nearly 1,000 pages, the book is arranged in four major parts: namely, Part I—Aliphatic Compounds; Part II—Carbocyclic Compounds; Part III—Heterocyclic Compounds; and Part IV—Organic Compounds with Heavy Hydrogen and Heavy Oxygen.

The chapters of Part I, totaling 21, are grouped into six sections. These sections are: Hydrocarbons and Compounds with a Monovalent Function, Compounds with a Divalent Function, Compounds with a Trivalent Function, Compounds with Tetravalent Functions, Compounds with Two Functions in the Molecule, and Compounds with Three or More Functions in the Molecule.

There are 37 chapters in Part II, and they are grouped together into four sections: namely, Compounds with a Monovalent Function, Compounds with Di- and Trivalent Functions, Pyrone Compounds, Indigo Dyes, and Quinones.

The fourteen chapters of Part III are grouped in two sections. These sections are: Simpler Heterocyclic Compounds with More or Less Aromatic Nature and Alkaloids.

No section or chapter heading is given in Part IV.

A series of tables and an index completes the volume.

The price of the book is $7.50 a copy. The publisher is Elsevier Publishing Company, Inc., 215 Fourth Ave., New York 3, N. Y.

Encyclopedia of Hydrocarbon Compounds (C_1 to C_5 inclusive)—Compiled by Dr. Joseph E. Faraday, this loose-leaf volume presents the following information concerning each of the hydrocarbons (C_1 to C_5 inclusive) wherever such details are available: molecular formula, structural formula, occurrence in nature, names of the compound, all known methods of preparation with complete bibliography, physical constants, methods of detection and determination, and outstanding properties and reactions. The sources of information have been Beilstein's Handbuch der Organischen Chemie and its supplements, Chemical Abstracts, British Chemical Abstracts, and Chemisches Zentralblatt.

The system of arrangement is that of Richter's Lexicon der Kohlenstoff Verbindungen in as far as it applies to compounds of carbon and hydrogen only.

The information in this volume is complete up to January 1, 1944, with the exception of that contained in Chemisches Zentralblatt later than July 1, 1939, which is not included in the other abstract journals. When this information becomes available, it is planned to include it with supplements scheduled to follow at short intervals.

The price of the volume is $15.00 a copy; the publisher, Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, New York.

Modern Packaging Encyclopedia, 1946-47 Edition, edited and published by the staff of Modern Packaging Magazine—was formerly known as the Packaging Catalogue; its change in title is indicative of the accuracy and value of the information it contains. The Encyclopedia covers a wide variety of subjects relating to the packaging industry including design, legal considerations, materials, package parts, packages, packaging machinery, and manufacturing techniques. An alphabetical index of subjects included in the work makes the contents more accessible. Consisting of fifteen separate chapters, the Encyclopedia opens with a discussion of Package Development. Individual sections are devoted to the particular phases of industry. Advertisements are broken down to meet the sectional separation of editorial matter. A directory of trade names is included, as well as an alphabetical list of manufacturers and their addresses. The book is 8½ by 11¼ inches overall, bound with board cover, leatherette finished, and has tabbed spacers for ready reference to sections of its contents. Priced at $6.00 per copy, the Encyclopedia is published by the Packaging Catalogue Corp., 122 East 42nd Street, New York 17, N. Y.

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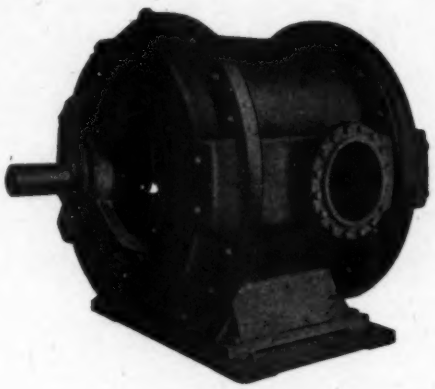

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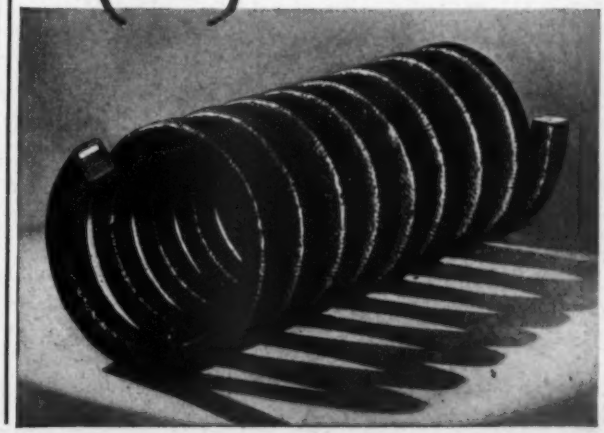

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Khaki Cuttings—	
Bleachable	–4.25
Unbleachable	–3.50
New White Canvas	–6.50
New Mixed Blacks	–3.25
Canton Flannels, Bleached	–7.00
Shirt Cuttings—	
New White No. 1	–7.25
No. 1 White Headings	–7.25
White Shrunk	–5.00
Silesias No. 1	–5.75
New Unbleached	–7.50
Fancy	–3.50
Linen Cuttings—	
American	–8.00
White	–14.00
Grey	–14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowance of $1 to $2 a ton depending on the value of the grade involved.

Roofing	per ton
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
White, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shapperies	

ROPE and BAGGING

f. o. b. and ex dock New York City

Gunny No. 1—	per cwt.
Foreign	Nominal
Domestic	$4.75 to 5.00
Wool Tares—	per cwt.
Light	4.75 to 5.00
Heavy	5.00 to 5.25
No. 1 Scrap Bagging	4.00 to 4.25
Manila Rope—	
No. 1 large	–*115.00
No. 1 small	–*105.00
Sisal Rope—	
No. 1 large	–*95.00
No. 1 small	–*80.00
New Burlap Cuttings	5.50 to 5.75
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	–*80.00
No. 2 sisal	–*80.00
Soft jute	5.00 to 5.50
Mixed	2.00 to 2.25

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment for machine compressed bales weighing not less than 500 pounds (with differential of $5 per ton less on certain grades for loose or bundled stock), plus $3.00 per ton loading charge, and brokers' allowance of 4 to 9 per cent.

Shavings—	per ton
White Env. Cuts, One-Cut	67.50–
Hard White Env. Cuts	62.50–
Hard White, No. 1	57.50–
Soft White, No. 1	50.00–
Soft White, One-Cut	57.50–
Soft White, Misc.	43.00–
Fly Leaf, No. 1	33.50–
Fly Leaf, Woody, No. 1	25.00–
No. 2 Mixed Col. Woody	18.00–
Flat Stock—	
No. 1 Heavy Books and Magazines	38.50–
Mixed Books	22.00–
Ledger Stock—	
No. 1 White	46.00–
No. 1 Mixed (Colored)	40.00–
Manilas—	
New Env. Cuttings	53.00–
New Env. Cuts, One-Cut	57.50–
Extra Manilas	39.00–
Manila Tab Cards, Free of Ground Wood	45.00–
Ground Wood Manila Tab Cards	27.00–
Kraft—	
Envelope Cuttings	65.00–
Mixed Env. or Bag Cuts	55.00–
Tripled Sorted No. 1 Brown	50.00–
New 100% Cor. Cuts	45.00–
No. 1 Old Assorted	35.00–
News—	
White Blank	35.00–
Overissue	22.00–
No. 1 Baled	20.00–
Old Corrugated Containers	23.00–
New Corrugated Cuts	18.00–
Mill Wrappers	22.00–
Box Board Chips	14.50–
No. 1 Mixed Paper	19.00–

CHEMICALS

f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25–
Ground, cwt.	4.60–
Powdered, cwt.	4.40–
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to —
Bleaching Powder—	
Drums, cwt.	2.25 to 2.10
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb. (N)	48.00 to 49.00
Argentine, lb. (N)	45.00 to 46.00
China Clay—	
Domestic Filler Bulk (mine) ton	8.00 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	22.00 to 25.00
Chlorine—	
Tank cars (wks) cwt	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09¾ to 10¾
Rosin (Gum)—	
New York, per 100 lbs.	
E	8.23—
F	8.77—
G	8.85—
WW	8.90—
Rosin (Wood), carlots	6.00—
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock—	
(Atl. ports) ton (Nom.)	20.00 to —
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30–
Ground and flake, drums, cwt.	2.70 to 2.95
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	5.37—
Pearl, barrels, cwt.	5.95—
Paper (Sp.) bags, cwt.	5.95—
Powdered, barrels, cwt.	6.02—
Sulphur (Crude) (Mine) bulk, long ton	16.00 to —
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 25.00
Canadian	24.00 to 30.00
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06¾
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	8.25 to 8.50

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo. (West of the Continental Divide and in Denver, Colo., ceilings are $6 per ton lower):

Bleached softwood sulphite	103.50
Unbleached softwood sulphite	90.00
Bleached hardwood sulphite	100.50
Unbleached hardwood sulphite	87.50
Northern bleached sulphate	103.50
Southern bleached sulphate	97.00
Northern semi-bleached sulphate	93.00
Southern semi-bleached sulphate	91.50
Northern unbleached sulphate	83.50
Southern unbleached sulphate	76.50
Bleached soda	93.50
Unbleached soda	83.00
Ground wood pulp	64.00
Ground wood—paper machine dried and mutilated	67.00
Sulphite screenings	50.00
Sulphate screenings	44.00
Ground wood screenings	37.50
Northern unbleached sulphate sideruns	83.50
Southern unbleached sulphate sideruns	76.50
Standard news print sideruns	64.00

PAPER

f. o. b. New York City

Boards—	per ton
Binders	60.00—
Chip	58.00—
Chip, tube and can	58.00—
Chip, full-blending	60.00—
Chip, sgl. mla. lined	65.00—
Coated, white patent .016	84.00—
.020 and heavier	79.00—
Kraft liner	74.00—
Filled News	58.00—
Container	58.00 to 60.50

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o. b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	9.35
B Grade E. F.	8.85
C Grade E. F.	8.55
D Grade E. F.	8.25
No. 2 Uncoated Offset 4 sides, White	8.45

Coated White (Trimmed 4 sides)

No. 1 Glossy	13.65
No. 2 Glossy	12.40
No. 3 Glossy	11.60
No. 4 Glossy	11.15
C1S Offset	10.40
C1S Litho (Varnish)	10.05
C1S Litho (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b. mill with zone, quantity, packing and other differentials allowed:

Bag Content Bond—	per cwt. 20 lb.	16 lb.
Extra 100% Rag	34.00	34.00
100% Rag	28.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.25
25% Rag	14.00	15.00

Bag Content Ledger—	per cwt. Zone 1
Extra 100% Rag	35.00
100% Rag	29.00
85% Rag	26.00
75% Rag	21.00
50% Rag	17.00
25% Rag	15.00

Sulphite Bond—	per cwt. 20 lb.	16 lb.
Air dry, watermarked	12.75	13.70
No. 1 (M.F.) watermarked	9.00	9.70
No. 2 (M.F.) watermarked	8.25	8.85
Plain (M.F.) unwatermarked	7.80	8.20

Sulphite Ledger—	per cwt. Zone 1
No. 1 (M.F.) watermarked	10.00
No. 2 (M.F.) watermarked	9.25
Plain (M.F.) unwatermarked	8.60

Glassine (f. o. b. mill)—	per cwt.
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleached (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleached (25 lb. up)	11.00 to 11.50
Unbleached (25 lb. up)	10.00 to 10.50

News—OPA Ceilings—	per ton
Rolls, Standard (Contract)	84.00
Rolls (Spot)	(Nominal)
Sheets	

Tissues (Carlots)—	per ream
White No. 1	1.22½—
White No. 2	1.00—
Bleached Anti-Tarnish	1.30—
Colored	—
Anti-Tarnish Kraft	1.15—
Manila	1.00—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.60–
Napkins, full crepe and emb'sed (12½ lb to M shts.) per cs.	.60–
Toilet, Bleached (M shts.) per cs.	6.05—
Toilet, Unbleached (M shts.) per cs.	4.47—

Towels—	per case
Bleached	3.39 to 3.99
Unbleached	2.76 to 3.43

Wrappings (Kraft)—	per cwt.
Super-Standard	5.25 to 7.65
No. 1 Wrapping	5.00 to 7.40
Standard Wrapping	4.75 to 7.15
Standard Bag	4.37½
Variety Bag	4.03½—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	
Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 30 lb. (Carloads only) (10,000 lbs.)	7.25 to 7.50
Drug wrapp. 35 lb.	7.50 to 7.75
	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 50 lb.	5.50 to 5.75

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.50
Envy. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envy. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M.G. Sulphite and Kraft (other than Waxing)	
Grade B-30 lb.	6.75 to 7.00
Grade A-32 lb.	7.25 to 7.47

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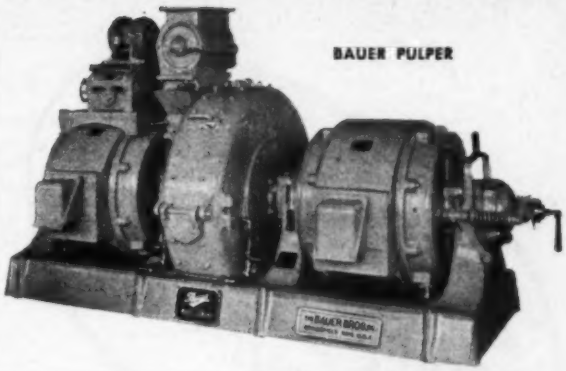

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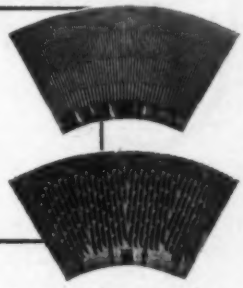
KNOW YOUR STOCK



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It might be to your advantage to forward samples of your stock for study—perhaps send someone to take part in the various tests that would be made.

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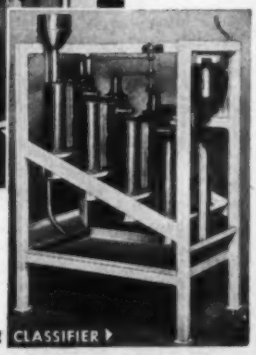

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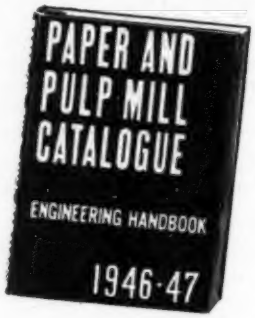

BIGGER—BETTER CATALOGUE SECTION

Prominent manufacturers of pulp and paper mill equipment and supplies present in these descriptive pages important information about their products.

COMPLETE CROSS-INDEXED BUYER'S GUIDE

Complete cross-indexed buyer's service listing sources of purchase of machinery, equipment, chemicals and supplies and other important information.

INCREASED—VALUABLE ENGINEERING DATA

Pertinent tables, charts and other authoritative data relative to the proper operation and maintenance of pulp and paper mills.

These firms describe their products in the 1946-47 edition

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Allis-Chalmers Mfg. Company
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Armour & Company
Armstrong Machine Works
Atkins & Company, E. C.
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Aurora Pump Co.

Bagley & Sewall Company, The
Bauer Bros. Company, The
Becco Sales Corporation
Beloit Iron Works
Biggs Boiler Works Co., The
Bird Machine Co.
Black-Clawson Co., The
Blaw-Knox Div. (Blaw-Knox Co.)
Blickman, Inc., S.
Bowser, Inc.
Buffalo Forge Company
Buffalo Pumps, Inc.
Buflovak Equipment Division (Blaw-Knox Co.)
Bulkley, Dunton Pulp Co., Inc.

Cameron Machine Company
Carbonite Metal Co., Ltd.
Carthage Machine Company
Cash Company, A. W.
Chemipulp Process, Inc.
Chicago Bridge & Iron Co.
Chicago Electric Company
Clark-Aiken Company, The
Control Equipment Corporation

Doublin Company
DoZurik Shower Company
Dilts Machine Works
Dow Chemical Company, The

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Dresser Industries, Inc.
Duriron Company, Inc., The

Electric Steel Foundry
English China Clays Sales Corp.

Falk Corporation, The
Farrel-Birmingham Co., Inc.
Fitchburg Screen Plate Co., Inc.
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Foster Wheeler Corporation
Foxboro Company, The
Fuller Brush Company, The

Garlock Packing Company, The
General American Transportation Corporation
Gibbs-Brower Company, Inc.
Glen Falls Machine Works, Inc.
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Golden-Anderson Valve Specialty Company
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Graver Tank & Mfg. Co., Inc.
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Inflico, Inc.

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Jeffrey Mfg. Co., The
Johns-Manville
Johnson & Carlson

Johnson Corporation, The
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Jones Fdry. & Mch. Co., W. A.

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Klemp Company, Wm. F.
Kohler System Company, The
Kut Kwick Tool Company, Inc.

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Langston Company, Samuel M.
Lawrence Mch. & Pump Corp.
Leader Iron Works, Inc.
Link-Belt Company
Lovejoy Flexible Coupling Co.

Mason-Neilan Regulator Co.
Maxson Automatic Mchy. Co.
Merrick Scale Mfg. Co.
Michigan Pipe Company
Monsanto Chemical Company
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Moyno Pump Div., Robbins & Myers, Inc.
Murray Mfg. Co., D. J.

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National Casein Sales
Naylor Pipe Company
Nekoosa Fdy. & Mch. Wks., Inc.
Nichols Eng. & Research Corp.
Noble & Wood Mch. Co., The
Norma-Hoffmann Bearings Corporation
Northern Engineering Works

Ohio Grease Company, The
Oliver United Filters, Inc.

Paper & Industrial Appl., Inc.
Paper Makers Chem. Dept. (Hercules Powder Co., Inc.)
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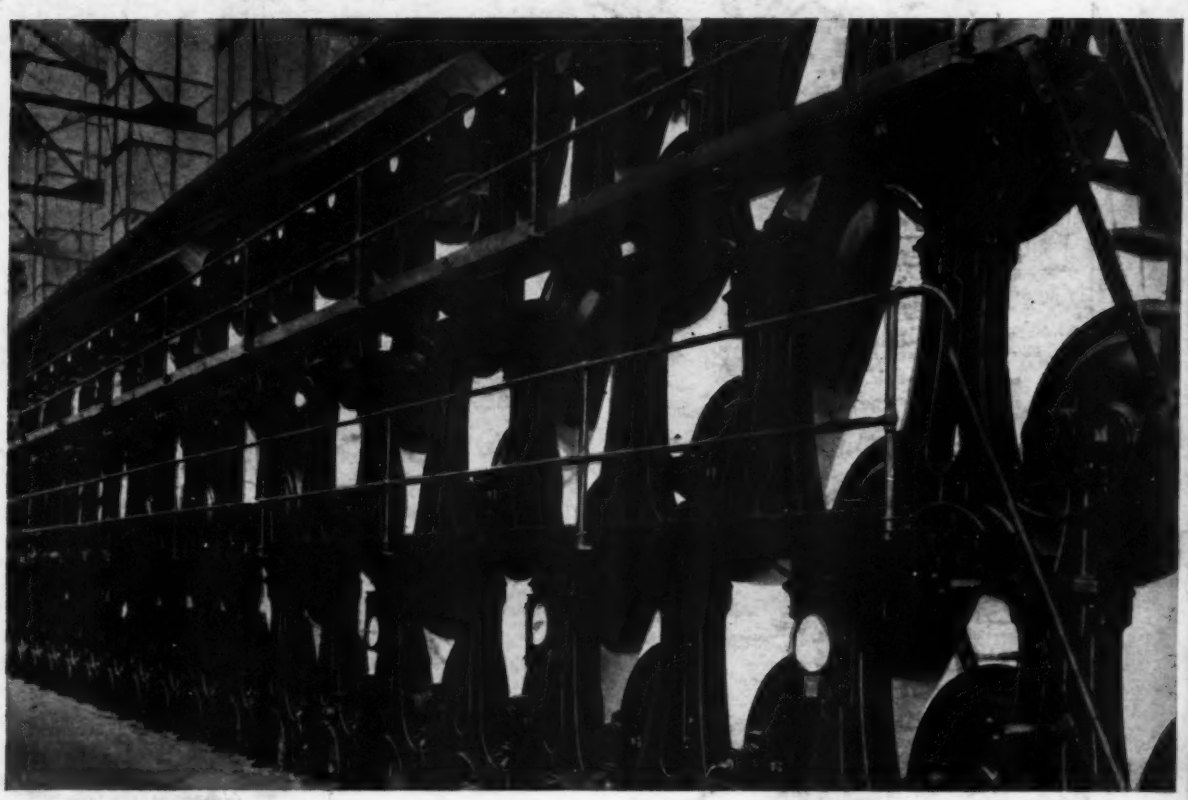

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